

PCR:SRI 19025

# **ASIAN DEVELOPMENT BANK**

## **PROJECT COMPLETION REPORT**

**ON THE**

**KIRINDI OYA IRRIGATION AND SETTLEMENT PROJECT  
[LOAN NOS. 324, 612 AND 794-SRI(SF)]**

**IN**

**SRI LANKA**

**September 1995**

## CURRENCY EQUIVALENTS

Currency Unit - Sri Lankan Rupees (SLRs)

**At Appraisal (30 September 1977)**

SLRs8.61 = \$1.00

**At Appraisal of Reformulated Project**

**- Phase I (30 September 1982)**

SLRs20.91 = \$1.00

**At Appraisal of Phase II (30 September 1986)**

SLRs28.05 = \$1.00

**At Project Completion (30 June 1995)**

SLRs49.95 = \$1.00

## ABBREVIATIONS

ARTI	-	Agrarian Research and Training Institute
ARU	-	Agricultural Research Unit
BC	-	Branch Canal
BOC	-	Bank of Ceylon
CBSL	-	Central Bank of Sri Lanka
CCC	-	Central Coordination Committee
COFO	-	Cattle Owners Farmer Organization
DADDP	-	Draft Animal and Dairy Development Program
DCO	-	Distributary Canal Organization
DOA	-	Department of Agriculture
DOF	-	Department of Forests
DOI	-	Department of Irrigation
DTC	-	District Training Center
FO	-	Farmer Organizations
IFAD	-	International Fund for Agricultural Development
IIMI	-	International Irrigation Management Institute
IMD	-	Irrigation Management Division
KfW	-	Kreditanstalt für Wiederaufbau
KOISP	-	Kirindi Oya Irrigation and Settlement Project
KOPMC	-	Kirindi Oya Project Management Committee
LB	-	Left Bank
LCD	-	Land Commissioner's Department
NIS	-	New Irrigation System
NWSDB	-	National Water Supply and Drainage Board
OEIS	-	Old Ellegala Irrigation System
OFC	-	Other Field Crops
O&M	-	Operation and Maintenance
PB	-	People's Bank
PCC	-	Project Coordination Committee
PM	-	Project Manager
PMC	-	Project Management Committee
RB	-	Right Bank
RRDB	-	Regional Rural Development Bank
SCF	-	Sectoral Conversion Factors
SDR	-	Special Drawing Rights
WFP	-	World Food Programme

## NOTES

- (i) The fiscal year (FY) of the Government ends on 31 December.
- (ii) In this Report, "\$" refers to US dollars.

## **GLOSSARY**

Advanced Alienation	-	A policy of settling people prior to land development for cultivation
Anicuts	-	Diversion weir
Bushel	-	Volumetric measure of paddy equivalent to 20.8 kg
Chena	-	Slash-and-burn shifting cultivation practice
Cropping Intensity	-	Percentage of area cultivated during a season in relation to total command area
Irrigation Efficiency	-	Consumptive use divided by gross water usage, i.e., water duty minus losses divided by water duty
Kanna	-	Cultivation
Maha	-	Season between October and March signifying northeast monsoon
Oya	-	River
Puddling	-	Process of land preparation for sowing
System	-	Canals and structures
Tanks	-	Reservoir
Turnout	-	Irrigation outlet
Water Duty	-	Gross quantity of water used for cultivation represented as depth
Yala	-	Season between April-September signifying southwest monsoon

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(ii)  
**BASIC DATA**

**A. Loan Identification**

1. Country	:	Sri Lanka
2. Loan Nos.	:	The Bank Phase I 324-SRI(SF) 612-SRI(SF) Phase II 794-SRI(SF) IFAD 1 SRI/109 SRI KfW 78 65 157
3. Project Title	:	Kirindi Oya Irrigation and Settlement Project
4. Borrower	:	Democratic Socialist Republic of Sri Lanka
5. Executing Agencies	:	Irrigation Department (DOI) Land Commissioner's Department (LCD) Department of Agriculture (DOA) Central Bank of Sri Lanka (CBSL)

6. Amount of Loan (\$ million)		Phase I		Phase II
		324-SRI(SF)	612-SRI(SF)	794-SRI(SF)
Bank	Original	24.00	10.00	26.60
	Actual	20.00	9.47	15.48 <sup>a</sup>
IFAD		12.00	4.06 <sup>b</sup>	-
KfW <sup>c</sup>		13.30	7.60	-

7. PCR Number	:	SRI 341
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**B. Loan Data**

		Phase I		Phase II
		324-SRI(SF)	612-SRI(SF)	794-SRI(SF)
1. Appraisal				
-Date Started	:	12 Aug 1977	16 Mar 1982	2 Jun 1986
-Date Completed	:	31 Aug 1977	3 Apr 1982	20 Jun 1986
2. Loan Negotiations				
-Date Started	:	26 Oct 1977	11 Oct 1982	22 Sep 1986
-Date Completed	:	3 Nov 1977	15 Oct 1982	25 Sep 1986
3. Date of Board Approval	:	9 Dec 1977	9 Dec 1982	30 Oct 1986
4. Date of Loan Agreement				
-Bank	:	25 Jan 1978	17 Dec 1982	24 Nov 1986
-IFAD	:	20 May 1978	8 Dec 1982	-
-KfW	:	19 Sep 1979	7 Apr 1983	-
5. Date of Loan Effectiveness				
-In Loan Agreement	:	25 Apr 1978	17 Mar 1983	22 Feb 1987
-Actual	:	28 Apr 1978	21 Apr 1983	26 Feb 1987
-Number of Extensions	:	-	-	-
6. Closing Date				
-In Loan Agreement	:	31 Dec 1985	30 Jun 1986	30 Jun 1991
-Actual	:	29 Jan 1987	13 Oct 1989	10 Jan 1995
-Number of Extensions	:	1	4	3
7. Terms of Loan				
The Bank				
-Service Charge	:	1% per annum	1% per annum	1% per annum
-Maturity (Including Grace Period)	:	40 years	40 years	40 years
-Grace Period	:	10 years	10 years	10 years
IFAD				
-Service Charge	:	1% per annum	1% per annum	-
-Maturity (Including Grace Period)	:	50 years	40 years	-
-Grace Period	:	10 years	10 years	-

<sup>a</sup> Original Bank loan was SDR 22.152 million. At the time of loan approval, this was equivalent to \$26.6 million. At the time of actual loan closing, net loan amount was \$15.48 million (or SDR 11.337 million) with prior cancellations of \$15.27 million.

<sup>b</sup> Original IFAD loan was SDR5.5 million. At the time of loan closing, \$2.6 million was cancelled with the remaining net loan amount valued at \$4.06 million.

<sup>c</sup> Parallel cofinancing.

# 8. Disbursements

	(a) Dates		Final Disbursement	Time Interval
	Initial Disbursement			
324-SRI(SF)	4 Sep 1979		31 Dec 1985	6 years, 5 months
612-SRI(SF)	21 Apr 1983		6 Oct 1989	6 years, 6 months
794-SRI(SF)	11 Aug 1987		8 Aug 1994	7 years
	Effective Date		Original Closing Date	Time Interval
324-SRI(SF)	28 Apr 1978		31 Dec 1985	7 years, 8 months
612-SRI(SF)	21 Apr 1983		30 Jun 1986	3 years, 2 months
794-SRI(SF)	26 Feb 1987		30 Jun 1991	4 years, 4 months

## (b) Amount (\$ million)

Category	Original Allocation *				Revised Allocation				Net Amount Disbursed				Undisbursed Balance			
	Phase I		Phase II		Phase I		Phase II		Phase I		Phase II		Phase I		Phase II	
	324/	612-SRI(SF)	794-SRI(SF)	324/	612-SRI(SF)	794-SRI(SF)	324/	612-SRI(SF)	324/	612-SRI(SF)	794-SRI(SF)	324/	612-SRI(SF)	794-SRI(SF)	324/	612-SRI(SF)
O1A	1.625			13.419	4.116		1.654		13.419	4.116		-11.794	-4.116			
O1B	0.865	0.974	2.286	1.026	0.702		1.654		1.025	0.702	1.654	-0.160	0.272	0.632		
O1C	0.250		0.073	0.381	0.057		0.050		0.381	0.057	0.050	-0.131	-0.057	0.023		
O1D			0.191				0.399				0.399			-0.208		
O1E			0.645				0.620				0.620			0.025		
O1F			1.054				0.378				0.378			0.676		
O1G			0.012				0.012				0.012			0.000		
O1H			0.168				0.110				0.110			0.058		
O1I		0.549			0.209					0.208			0.341	0.000		
O1J		0.821			0.759					0.759			0.062	0.000		
O1K		0.782	0.605		0.280	0.612				0.280	0.612		0.502	-0.007		
O1L																
O2	5.370			3.860					3.860			1.510				
O2A					0.178								0.775			
O2B		2.181			1.406					1.406			1.372			
O2C		1.372			1.274								0.195	0.038		
O2D		0.195	0.114		0.084	0.076					0.076		0.122	0.081		
O2E		0.122	0.554		0.318	0.473					0.473		0.318			
O2F		0.389			0.071					0.071						
O3	4.550			0.289					0.288			4.262		0.268		
O3A			0.366			0.098					0.098					
O4	0.490											0.490				
O4A			0.037			0.042				1.274	0.042		-1.274	-0.005		
O4B			0.010			0.011				0.084	0.010		-0.084	0.000		
O4C			0.197			0.120				0.318	0.120		-0.318	0.077		
O5				1.016	0.019				1.016	0.019		-1.016	-0.019			
O5A	0.607								0.008			0.599				
O5B	0.103											0.103				
O6	0.660			0.009						0.179		0.660	-0.179			

Category	Original Allocation *			Revised Allocation			Net Amount Disbursed			Undisbursed Balance		
	Phase I		Phase II	Phase I		Phase II	Phase I		Phase II	Phase I		Phase II
	324/	612 - SRI(SF)	794 - SRI(SF)	324/	612 - SRI(SF)	794 - SRI(SF)	324/	612 - SRI(SF)	794 - SRI(SF)	324/	612 - SRI(SF)	794 - SRI(SF)
07A			0.853			0.386			0.386			0.467
07B			0.082			0.046			0.046			0.016
08A			0.077			0.064			0.064			0.013
08B			0.151			0.136			0.136			0.015
09A			5.028			2.450			2.450			2.578
09B			0.025			0.021			0.021			0.004
09C			2.349			2.426			2.426			-0.077
09D			0.441			0.598			0.598			-0.157
09E			0.768			0.544			0.544			0.224
09F			3.244			0.883			0.883			2.361
09G			0.090			0.005			0.005			0.085
09H			0.228			0.059			0.059			0.169
09I			1.121			0.765			0.765			0.356
09J			0.034			0.027			0.027			0.007
09K			0.007			0.029			0.029			-0.022
09L			0.042			0.093			0.093			-0.051
09M			0.328			0.165			0.165			0.163
09N			0.169			0.060			0.060			0.109
09O			0.050			0.143			0.143			-0.093
09P			1.023			0.601			0.601			0.422
09Q			0.200			0.113			0.113			0.087
09R			0.058			0.029			0.029			0.029
09S			0.045			0.038			0.038			0.007
09T			0.169			0.206			0.206			-0.037
09U			0.007			0.006			0.006			0.001
09V			0.722			0.228			0.229			0.493
09W			0.049			0.015			0.015			0.034
09X			0.181			0.188			0.188			-0.007
10			0.424			0.494			0.494			-0.070
11	5.480	2.615	2.342			0.000			0.000	0.000	0.000	2.342
	20.000	10.000	26.600	20.000	9.473	15.473	19.997	9.473	15.473	0.003	0.527	11.127 *
* At reappraisal. Equivalent to \$15,267 million at the time of cancellation.												
01A	Civil Works (CWs) - Dam and Appurtenances			02E	E&V for Land Settlement			Local Costs (LC):			08P	LC - Livestock - O&M
01B	CWs - New Irrigation Facilities (Main Canals and Distribution System)			02F	E&V for Engineering and Administration			09A	LC - Irrigation Development - CW			LC - Agricultural Support - CW
01C	CWs - Settlement and Agricultural Facilities			03	Major Construction Materials (MCM)			09B	LC - Irrigation Development - V&E			LC - Agricultural Support - V&E
01D	CWs - Feeder Roads			03A	Building Materials			09C	LC - Irrigation Development - O&M			LC - Agricultural Support - O&M
01E	CWs - Water Supply System			04	Agricultural Development (AD)			09D	LC - Feeder Roads - CW			LC - Agricultural Support - V&E
01F	CWs - Hamlets, Village Centers, Market Facilities			04A	Breeding Stock			09E	LC - Water Supply - CW			LC - Agricultural Support - O&M
01G	CWs - Nursery Facilities for Forestry			04B	O&M for Nursery			09F	LC - Land Settlement - CW			LC - Agricultural Credit - V&E
01H	CWs - Rehabilitation of Existing Irrigation Systems			04C	O&M for Livestock			09G	LC - Land Settlement - Inputs			LC - Agricultural Credit - V&E
01I	CWs - Land Clearing and Leveling			05	Consulting Services (CS)			09H	LC - Land Settlement - V&E			LC - Consulting
01J	CWs - Reconstruction Facilities			05A	CS - Irrigation Works			09I	LC - Land Settlement - O&M			LC - Training
01K	CWs - Construction of Quarters for Operation and Maintenance (O&M) Staff			05B	CS - Agricultural Development			09J	LC - Forestry - CW			LC - PSBME
01L	Heavy Construction Equipment (HCE)			06	Administrative Expenses (AE)			09K	LC - Forestry - V&E			Service Charge
02A	HCE - Equipment			07A	Agri Credit - Tractors/Implements			09L	LC - Forestry - O&M			Unallocated
02B	HCE - Spare Parts and Tires			07B	Agri Credit - E&V			09M	LC - Livestock - CW			
02C	Machinery, Equipment/Vehicles (MEV) - Spillway/Sluice Gates for Headworks			08A	CS - Phase II			09N	LC - Livestock - Bstock			
02D	E&V for Agricultural Development			08B	CS - Training			09O	LC - Livestock - V&E			

**9. Local Cost Financing**

– Amount	:	\$11.39 million
– Percentage of Local Costs	:	19
– Percentage of Total Costs	:	12

**C. Project Data****1. Project Cost (\$ million)**

	Appraisal Estimate	Actual
<b>324–SRI(SF)</b>		
(a) Foreign Exchange Cost	24.00	25.80
(b) Local Currency Cost	42.80	26.00
(c) Total Cost	66.80	51.80 <sup>a</sup>
<b>612–SRI(SF)</b>		
(a) Foreign Exchange Cost	12.00	8.27
(b) Local Currency Cost	16.00	17.26
(c) Total Cost	28.00	25.53
<b>794–SRI(SF)</b>		
(a) Foreign Exchange Cost	10.20	5.29
(b) Local Currency Cost	22.90	16.69
(c) Total Cost	33.10	21.98
<b>Total</b>		
(a) Foreign Exchange Cost	46.20	39.36
(b) Local Currency Cost	81.70	59.95
(c) Total Cost	127.90	99.31

**2. Financing Plan (\$ million)**

	Appraisal Estimate	Actual
<b>324–SRI(SF)</b>		
(a) Borrower Financed	42.80	6.50
(b) Bank Financed	24.00	20.00
(c) IFAD	–	12.00
(d) KfW	–	13.30
(e) Total	66.80	51.80 <sup>a</sup>
<b>612–SRI(SF)</b>		
(a) Borrower Financed	4.40	4.40
(b) Bank Financed	10.00	9.47
(c) IFAD	6.00	4.06
(d) KfW	7.60	7.60
(e) Total	28.00	25.53
<b>794–SRI(SF)</b>		
(a) Borrower Financed	6.50	6.50
(b) Bank Financed	26.60	15.48
(c) IFAD	–	–
(d) KfW	–	–
(e) Total	33.10	21.98
<b>Total</b>		
(a) Borrower Financed	53.70	17.40
(b) Bank Financed	60.60	44.95
(c) IFAD	6.00	16.06
(d) KfW	7.60	20.90
(e) Total	127.90	99.31

<sup>a</sup> The Reformulated KOISP was estimated at \$79.8 million equivalent at the time of reappraisal in November 1982. With financing gap identified at \$28.0 million, the actual cost of Loan 324–SRI(SF) was worked out to be at \$51.8 million.



**3. Cost Breakdown by Project Component (\$ million)**

Phase I [Loans 324/612–SRI(SF)]	Appraisal			Actual		
	Foreign	Local	Total	Foreign	Local	Total
A. Irrigation and Related Facilities	28.07	21.23	49.31	32.04	22.99	55.03
1. Dam and Appurtenant Structures	23.93	14.02	37.95	28.32	16.63	44.95
2. Main Canals and Distribution System	3.68	5.97	9.66	3.46	5.66	9.12
3. Land Clearing and Leveling	0.00	0.00	0.00	0.00	0.00	0.00
4. Rehabilitation of Existing Irrigation Systems	0.46	1.24	1.70	0.26	0.70	0.96
B. Land Settlement	0.93	5.01	5.94	1.31	6.90	8.21
C. Agricultural Development	0.27	0.49	0.75	0.03	0.06	0.09
D. Consulting Services and Training	1.53	0.75	2.28	2.74	1.35	4.09
E. O&M Equipment	0.41	0.03	0.44	0.27	0.02	0.29
F. Preconstruction Facilities and Engineering Administration	1.13	2.09	3.22	1.96	3.62	5.58
G. Project Benefit Monitoring and Evaluation	0.66	0.24	0.90	0.03	0.09	0.12
Total Base Cost	33.00	29.84	62.84	38.38	35.03	73.41
Physical Contingencies	2.52	19.42 <sup>a</sup>	21.94	0.00	0.00	0.00
Price Contingencies	2.90	7.12	10.02	0.00	3.92	3.92
Total Phase I	38.42	56.38	94.80	38.38	38.95	77.33
<b>Phase II [Loan 794–SRI(SF)]<sup>b</sup></b>						
A. Irrigation Works	2.89	5.26	8.16	2.15	4.54	6.69
B. Feeder Roads and Water Supply	0.84	0.86	1.70	0.83	0.92	1.75
C. Land Settlement	1.98	7.08	9.06	0.94	1.62	2.57
D. Social Forestry	0.02	0.07	0.09	0.03	0.12	0.15
E. Livestock and Dairy Development	0.40	1.21	1.61	0.28	0.81	1.08
F. Agricultural Support Services	0.19	0.41	0.60	0.12	0.32	0.44
G. Agricultural Credit Support	0.92	0.19	1.11	0.43	0.00	0.43
H. Consulting Services and Training	0.23	0.54	0.77	0.07	0.25	0.32
I. Project Benefit Monitoring and Evaluation	0.00	0.12	0.12	0.00	0.07	0.07
Total Base Cost	7.46	15.75	23.21	4.86	8.65	13.51
Physical Contingencies	0.68	1.35	2.02	0.00	0.00	0.00
Price Contingencies	1.67	5.78	7.44	1.67	6.44	8.11
Service Charge During Construction	0.43	0.00	0.43	0.00	0.36	0.36
Total Phase II	10.23	22.87	33.10	6.53	15.45	21.98

<sup>a</sup> Including local costs for foreign exchange entitlement certificates and customs duties.<sup>b</sup> Actual cost converted using dollar equivalent of SDR at the time of loan closing.**4. Project Schedule of Important Events****Kirindi Oya Irrigation and Settlement Project Phase I****a. Civil Works – Irrigation****Dates of construction of the main dam**

– Commencement	:	1 Oct 1980
– Completion	:	31 Dec 1989

**Dates of construction of irrigation systems on the right and left banks**

– Commencement	:	1 Apr 1982
– Completion	:	30 Jun 1989
– Commissioning	:	15 Mar 1986

**Dates of land clearing and contour bunding for new farmlands**

– Commencement	:	1 Apr 1982
– Completion	:	31 Dec 1989

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<b>Dates of Rehabilitation of Badegiriya System</b>		
– Commencement	:	1 Jan 1984
– Completion	:	30 Jun 1986
<b>b. Civil Works – Settlement</b>		
<b>Dates of construction of settlement infrastructure</b>		
– Commencement	:	1 Jun 1983
– Completion	:	31 Dec 1988
<b>Dates of construction of water supply system</b>		
– Commencement	:	16 Jun 1988
– Completion	:	15 Mar 1992
<b>c. Civil Works – Agriculture</b>		
<b>Dates of construction of buildings for District Training Center and Adaptive Research Farm</b>		
– Commencement	:	1 Jan 1984
– Completion	:	31 Dec 1986
<b>Dates of land development for Adaptive Research Farm</b>		
– Commencement	:	1 Mar 1985
– Completion	:	30 Jun 1989
<b>d. Dates of Procurement of Vehicles and Equipment – Irrigation Works</b>		
– First Procurement	:	14 Mar 1979
– Last Procurement	:	16 Jul 1986
– Completion of Delivery	:	10 May 1987
<b>e. Dates of Procurement of Vehicles and Equipment – Operation and Maintenance</b>		
– First Procurement	:	3 Oct 1988
– Last Procurement	:	21 Nov 1988
– Completion of Delivery	:	15 Aug 1989
<b>f. Dates of Procurement of Vehicles and Equipment Land Settlement</b>		
– First Procurement	:	16 Sep 1980
– Last Procurement	:	13 May 1987
– Completion of Delivery	:	13 May 1987
<b>g. Dates of Procurement of Vehicles and Equipment Agriculture</b>		
– First Procurement	:	22 Sep 1983
– Last Procurement	:	Aug 1989
– Completion of Delivery	:	Dec 1989
<b>h. Dates of Engagement of Consultants Dam and Appurtenant Structures (WAPCOS)</b>		
– Date of Contract Award	:	3 Nov 1978
– Date of Commencement of Services	:	18 Nov 1978
– Date of Completion of Services	:	30 Jun 1986
<b>i. Dates of Engagement of Consultants Water Management</b>		
– Date of Contract Award	:	18 Jul 1986
– Date of Commencement of Services	:	18 Aug 1986
– Date of Completion of Services	:	Jul 1989
<b>j. Settlement Program</b>		
– Date when first family was settled	:	14 Jun 1982
– Date when last family was settled	:	30 Jun 1989

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**Kirindi Oya Irrigation and Settlement Project Phase II**

	<b>Commencement Dates</b>		<b>Completion Dates</b>
<b>a. Irrigation Works</b>			
- New irrigation facilities	Mar	1987	Jun 1991
- Works for existing facilities	Jun	1988	Mar 1994
- Hydrometric stations	Jul	1987	Sep 1988
- O&M houses	Jul	1987	Sep 1988
<b>b. Construction of Feeder Roads</b>	Jan	1990	Mar 1994
<b>c. Provision of Water Supply</b>	Apr	1992	Mar 1994
<b>d. Land Settlement Program</b>	Apr	1987	Sep 1991
<b>e. Social Forestry</b>			
- Civil works	Feb	1987	Oct 1990
- Woodlot and home lot development	Nov	1986	Dec 1993
<b>f. Livestock &amp; Dairy Development</b>			
- Land development	May	1987	Nov 1992
- Building construction	May	1987	Nov 1992
<b>g. Agricultural Development</b>	Nov	1986	Dec 1993
<b>h. Agricultural Credit</b>	Jul	1987	Dec 1983
<b>For all components:</b>			
- Equipment	Jan	1987	Nov 1993
- Consulting Services	Sep	1986	Mar 1994
- Training	Mar	1987	Aug 1992

**D. Data on Bank Missions**

<b>Type of Mission</b>	<b>Dates</b>		<b>Loan Nos.</b>	<b>No. of Professional Staff</b>	<b>No. of Person-days</b>	<b>Specialization of Members</b>
	<b>From</b>	<b>To</b>				
Preappraisal (1)	6 Jun 1977	15 Jun 1977	324	3	9	b-1, c-1, d-1
Appraisal (2)	12 Aug 1977	31 Aug 1977	324	7	19	c-1, d-1, e-2, g-1, i-1, j-1
Inception (1)	28 Mar 1978	13 Apr 1978	324	2	16	c-1, e-1
Review (1)	19 Mar 1979	26 Mar 1979	324	2	7	b-1, c-1
Inception/Review (2)	23 Sep 1979	4 Oct 1979	324	5	11	b-1, e-1, h-1, k-1, l-1
Midterm Review (3)	1 Apr 1980	17 Apr 1980	324	4	16	b-1, c-1, j-1
Review (4)	9 Sep 1980	18 Sep 1980	324	3	9	b-1, c-1, l-1
Special Loan Administration (1)	8 Dec 1980	18 Dec 1980	324	2	10	b-1, c-1
Consultation (1) <sup>a</sup>	12 Apr 1981	17 Apr 1981	324	2	5	a-1, c-1
Country Loan Disbursement <sup>b</sup>	4 Oct 1982	15 Oct 1982	324	3	11	a-1, c-1, h-1
Country Loan Disbursement <sup>c</sup>	6 Apr 1983	12 Apr 1983	324	3	6	b-1, c-1, h-1
Reappraisal (3)	25 May 1981	12 Jun 1981	324/612	6	18	a-1, c-1, d-1, e-1, j-2
Reappraisal (4)	12 Oct 1981	16 Oct 1981	324/612	9	4	a-1, c-1, d-1, e-1, j-3, k-1, l-1
Reappraisal (5)	16 Mar 1982	3 Apr 1982	324/612	9	18	c-2, d-1, e-1, f-1, i-1, j-1
Reappraisal (6)	18 Jul 1983	22 Jul 1983	324/612	2	4	f-1, l-1
Review (5)	28 Sep 1983	5 Oct 1983	324/612	3	7	c-1, j-1, k-1
Review (6)	1 Mar 1984	8 Mar 1984	324/612	3	7	c-1, j-1, l-1
Country Loan Disbursement <sup>d</sup>	23 May 1984	31 May 1984	324/612	2	8	c-1, h-1
Special Loan Administration (2)	17 Sep 1984	21 Sep 1984	324/612	3	4	a-1, c-1, l-1
Review (7)	9 Oct 1984	17 Oct 1984	324/612	4	8	c-1, j-3
Special Loan Administration (3)	13 Mar 1985	17 Mar 1985	324/612	1	4	c-1
Special Loan Administration (4)	6 May 1985	8 May 1985	324/612	2	2	c-1, i-1
Review (8)	19 May 1985	26 May 1985	324/612	3	7	c-1, d-1, e-1, j-1
Special Loan Administration (5)	7 Oct 1985	23 Oct 1985	324/612	5	16	c-1, d-1, e-1, j-2

(ix)

Type of Mission	Dates		Loan Nos.	No. of Professional Staff	No. of Person-days	Specialization of Members
	From	To				
TA Inception	31 Jan 1986	6 Feb 1986	794	2	6	c-1, d-1
TA Review (PPTA)	3 Mar 1986	15 Mar 1986	794	5	12	c-1, e-1, j-3
Fact-finding	23 Apr 1986	2 May 1986	794	4	9	c-1, d-1, e-1, j-1
Reappraisal (7)	2 Jun 1986	12 Jun 1986	794	4	10	c-1, e-1, j-1, l-1
Special Loan Administration (6)	24 Aug 1986	7 Sep 1986	794	1	14	j-1
Review (9)	10 Feb 1987	20 Feb 1987	612/794	1	10	l-1
Review (10)	23 Mar 1987	31 Mar 1987	612/794	2	8	c-1, j-1
Review (11)	28 May 1987	6 Jun 1987	612/794	6	9	c-2, j-1, l-3
Review (12)	26 Jan 1988	9 Feb 1988	612/794	2	14	c-1, l-1
Review (13)	15 Nov 1988	30 Nov 1988	612/794	1	15	c-1
Review (14)	16 May 1989	6 Jun 1989	612/794	3	21	c-1, k-1, l-1
Review (15)	18 Mar 1990	28 Mar 1990	612/794	1	10	e-1
Review (16)	31 Aug 1990	18 Sep 1990	794	1	18	c-1
Reformulation	6 May 1991	23 May 1991	794	3	17	c-1, j-2
Review (17)	8 Jun 1992	29 Jun 1992	794	1	21	c-1
Review (18)	7 Mar 1994	24 Mar 1994	794	1	17	c-1
Project Completion	15 Jun 1995	30 Jun 1995	324/612/	1	15	b-1, j-1
Review *			794			

a	director/deputy director/manager	g	programs officer
b	project officer	h	control officer
c	project engineer	i	counsel
d	agronomist/rural development specialist	j	consultant
e	economist/financial analyst/statistician	k	IFAD representative
f	environment specialist	l	KfW representative

Notes:

<sup>a</sup> One of two Sri Lanka projects.

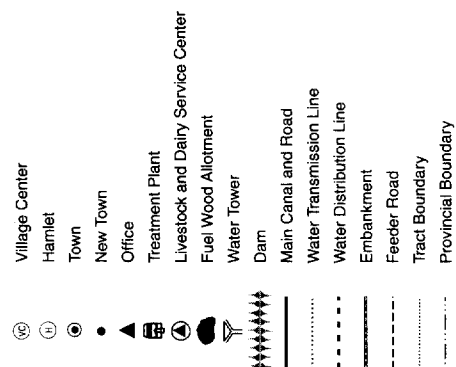
<sup>b</sup> Among 9 projects covered.

<sup>c</sup> Among 7 projects covered.

<sup>d</sup> Among 12 projects covered.

<sup>e</sup> The Mission was composed of J.U. Rahman (Sr. Project Specialist, AWOD); F. Marikar (Staff Consultant); and P. Pandato (Sr. Assistant Specialist).

The map shows the island of Sri Lanka with its major cities and districts. The project area is located in the north-east, near Hambantota. Key locations marked include Jaffna, Mannar, Anuradhapura, Puttalam, Kurunegala, Kandy, N. Eliya, Badulla, Pottuvil, Welisara, Hambantota, and Galle. The project area is highlighted in a box in the north-east, near Hambantota. The map also shows the Bay of Bengal to the north and the Indian Ocean to the east.



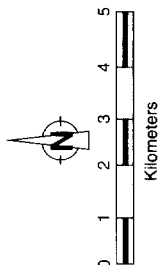
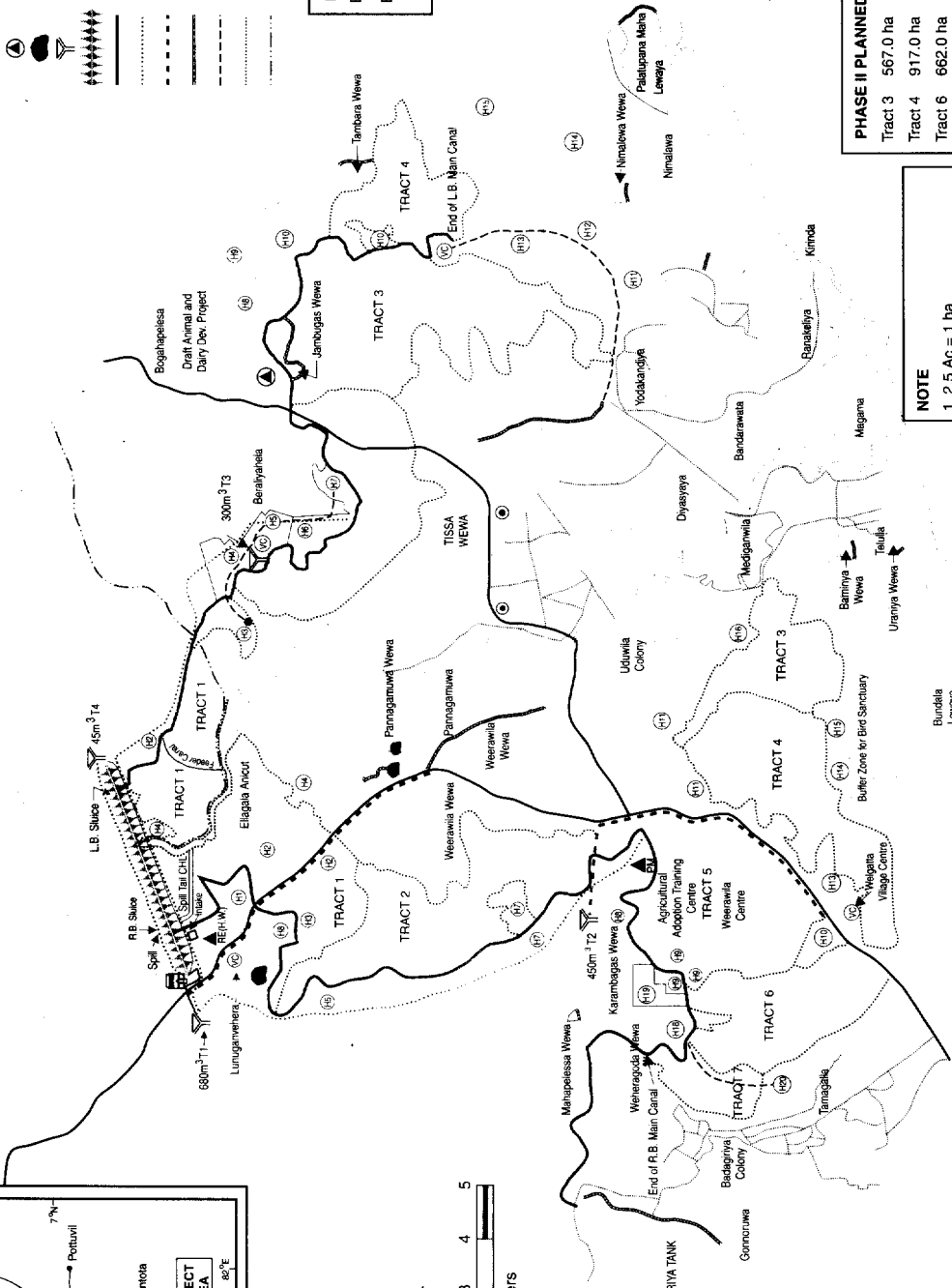
<b>PHASE I (Existing Area)</b>	
Badariya Scheme	850.0 ha
Eliagala Systems	3734.0 ha
	<hr/> 4584.0 ha

DEVELOPMENT PROGRAMME		
	Phase 1 (New Area)	
	Right Bank	Left Bank
Tract 1	851.0 ha	719.0 ha
Tract 2	686.0 ha	903.0 ha
Tract 5	1005.0 ha	
	<u>2724.0 ha</u>	<u>1622.0 ha</u>

PHASE II PLANNED (ACTUAL)			
Tract 3	567.0 ha	( - )	1288.0 ha (320.0 ha)
Tract 4	917.0 ha	( - )	440.0 ha ( - )
Tract 6	682.0 ha	(550.0 ha)	( - ) ( - )
Tract 7	234.0 ha	(200.0 ha)	( - ) ( - )
	2380.0 ha	(750.0 ha)	1728.0 ha (320.0 ha)

### NOTE

1. 2.5 Ac = 1 ha



## I. PROJECT DESCRIPTION

1. The Kirindi Oya Irrigation and Settlement Project (KOISP) was a high priority project of the Government of Sri Lanka. Based on findings of a project preparatory technical assistance (TA) in 1976<sup>1</sup> and appraisal in 1977, the Bank approved a loan.<sup>2</sup> Subsequently, cofinancing was arranged by the Government from the International Fund for Agricultural Development (IFAD) and Kreditanstalt für Wiederaufbau (KfW). The investment requirements of the Project were reformulated into two phases in 1982 in view of the cost increases and implementation delays. Supplementary financing was approved by the Bank<sup>3</sup> and cofinanciers (IFAD and KfW) for Phase I. Certain design adjustments were made to ensure better attainment of KOISP's<sup>4</sup> broad objectives. The second phase was financed by a loan<sup>5</sup> from the Bank only. The background information on the Project is set out in Appendix 1. The scope of the original project and of reformulated Phases I and II are in Appendix 2. In addition, an accompanying advisory TA was approved with the Phase II loan for institutional strengthening of the Department of Irrigation (DOI).

2. One of the principal elements of the Government's medium-term agriculture sector policies and strategies is to augment agricultural production through rehabilitation and expansion of existing irrigation facilities, and the provision of new irrigation capacities and basic infrastructure facilities in the dry zone.<sup>6</sup> The Accelerated Mahaweli Development Program is the forerunner of this strategy. KOISP is one of such major schemes and the largest one in the south covering the dry zone. KOISP had objectives similar to the Government's medium-term agriculture sector strategies and comprised, among others, increased food and fiber production, generation of employment, and settlement of landless people. An old area [existing irrigation systems of Ellegala and Badagiriya (4,500 ha)] and a new area were to be serviced by the Right Bank (RB) and the Left Bank (LB) main canals (8,400 ha). The scope and objectives of the Project were detailed in three project appraisal reports and are summarized in Appendix 3. The specific irrigation, settlement, and agricultural targets of KOISP, as appraised in 1977, could be divided into four categories: (i) irrigation works including a dam,<sup>7</sup> (ii) land settlement, (iii) agricultural development, and (iv) provision of consulting services. The broad objectives of KOISP, as formulated in 1977, remained largely valid during the reformulation exercise in 1982 and were largely reconfirmed during Phase II appraisal of the Project in 1986. The Economic Internal Rate of Return (EIRR) of KOISP was estimated at 17.6 percent.

3. The overall Project implementation performance was adversely affected by a number of factors, besides the issue of financing. These include (i) the longer than estimated

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<sup>1</sup> TA No. 168: *Lunugamwehera Reservoir (Irrigation and Agricultural Development)*, for \$49,000, approved on 7 July 1976.

<sup>2</sup> Loan No. 324-SRI(SF): *Kirindi Oya Irrigation and Settlement Project* approved on 9 December 1977.

<sup>3</sup> Loan No. 612-SRI(SF): *Kirindi Oya Irrigation and Settlement (Supplementary) Project* approved on 9 December 1982.

<sup>4</sup> In this Report, reference to KOISP stands for the project appraised in 1977, Phase I refers to reformulation in 1982, Phase II relates to the project as appraised in 1986, and the expression "Project" stands for all three.

<sup>5</sup> Loan No. 794-SRI(SF): *Kirindi Oya Irrigation and Settlement (Phase II) Project* approved on 30 October 1986.

<sup>6</sup> Refer to paras. 1 and 2 of Appendix 1.

<sup>7</sup> Both the dam and its reservoir are located east of Lunugamwehera Village in Monaragala District, just bordering Hambantota District; however, the service area of the irrigation scheme under KOISP falls under Hambantota District.

time to complete design work, (ii) severity of the Government's budgetary constraints, (iii) unforeseen inflation consequent to the second energy crisis in 1979/80, (iv) increased migration of technical and skilled manpower, (v) inordinate delays experienced in procurement decisions and the award of contracts, and (vi) poor performance of contractors. In view of the cost increases and implementation delays, the Government agreed with the suggestion of the Bank and cofinanciers to implement the Project in phases. The Bank's TA<sup>1</sup> for reformulation recommended a two-phase approach (a brief description of the reformulation is in Appendix 4). The new irrigation area and the number of settlers were reduced by half. The remaining half was to be taken up under Phase II. The EIRR of Phase I was worked out at 11 percent. The EIRR of Phase II was estimated at 19 percent. Sensitivity analysis covering a 20 percent increase in cost, 20 percent decrease in benefits, and one-year delay in accrual of benefits reduced the EIRR to a level of 13 percent. The EIRR of both Phases I and II was estimated at 13.6 percent.

## II. EVALUATION OF IMPLEMENTATION

### A. Project Components

4. The evaluation of implementation performance is detailed below, by component, with emphasis on system operations, realization of targets, and achievements.

#### 1. Dam Embankment and Reservoir

5. The civil works consisting of the embankment, the spillway, RB sluice and LB sluice were completed mainly through domestic contractors and partly through international contractors working under other projects in Sri Lanka at that time. The tendering process commenced in June 1979 and construction was completed in June 1986. Technical problems associated with dam construction and contractors' poor performance, including liquidity problem, caused the delay. Additional delay factors were difficulties encountered in the recruitment of consultants; the longer than expected time required to complete detailed designs, and in awarding contracts for civil works and supplies; need for additional materials; and increase in the distance for procuring borrowed materials. Similar problems and delays were experienced with the two sluices and six spillway radial gates. The provision made under Phase I of the Project to constitute a Technical Review Panel to advise on dam design and construction was appropriate and the Panel met regularly. Reservoir safety operations procedures, including a piezometer system for measuring water pressure, an inspection gallery, etc. were found to be operational. Data on discharges such as sluice discharge variation, tank water level, and inflow are regularly being collected, compiled, and analyzed to arrive at corrective measures. Data with regard to wind speed, sunshine hours, dam evaporations, and rainfall are also being collected and sent to DOI for use. The spillway, embankment, and sluices were found to be in good operating condition; however, sections of the embankment slopes were damaged by unregulated cattle grazing.<sup>2</sup> This requires frequent additional maintenance.

<sup>1</sup> TA No. 407-SRI: *Kirindi Oya Irrigation and Settlement*, for \$50,000, approved on 23 July 1981.

<sup>2</sup> Action plan, referred to in para. 60, provides remedial measures in respect of this and other deficiencies in implementation mentioned in this report.

## 2. Main and Distribution Canals including Rehabilitation of Existing Canals

6. Related civil works commenced in 1978. It was suspended later to have time for redesign. The work recommenced in 1983 for both RB and LB main canals under Phase I. Both canals were redesigned as double bank canals and implemented through domestic contractors under two main contracts. Contracts execution experienced common problems principally because of the poor performance of the contractors and the increased quantities of work due to design changes. DOI supervised the construction of the distributary and field canals through small contractors and the work was successfully completed. The work related to rehabilitation was also completed by DOI successfully through force account and small-scale contractors. Consequent to water shortage, a number of decisions were taken to reduce the length of LB canal and the scope of work under both RB and LB canals (Appendix 5). All as-built drawings, destroyed during the insurgency of 1989, were redone by DOI.

7. System structure construction was of an acceptable quality. The structures are being maintained reasonably well with some exceptions. Resource allocation for the maintenance of the Project systems was found to be low. Compared with maintenance allocations ranging between SLRs53 and SLRs87 per acre in Hambantota region, the Project's allocation for operation and maintenance (O&M) during 1992 was only SLRs54. The bulk of this allocation was to meet administrative expenditures. As such, the money available for O&M was inadequate. An interrelated issue relates to a quick and efficient change from a construction-oriented organizational structure to an O&M-focused one. Such changes are underway; however, they have been slow so far.

### a. Assessment of Water Availability and Release

8. Against the original target of developing a total irrigable area<sup>1</sup> of 12,930 hectares (ha), 77 percent or 9,940 ha was developed. This was due to the less than estimated level of average inflow of water. Although the water resource potential of Kirindi Oya basin was examined several times, the actual estimated average inflow into the Lunugamwehera reservoir was less by 25 percent up to water year 1992/93<sup>2</sup> compared with the Bank estimate of 1976. The prolonged drought<sup>3</sup> experienced in the basin area aggravated the situation. The principal reason for the decline of inflow could be the perceptible drop in the weighted average rainfall in the basin (from 1,646 mm to 1,152 mm between 1986 and 1993). The release potential from Lunugamwehera reservoir was reassessed at 294 million cubic meters (m<sup>3</sup>) during appraisal in 1982 and 297 million m<sup>3</sup> in 1986. The actual average annual release between water years 1987/88 and 1994/95 was about 196 million m<sup>3</sup> or 66 percent of the projection. Thus, an annual cropping intensity of 132 percent was possible. During the Mission's visit in June 1995 (*yala*), the reservoir was almost full with the level at 189 feet mean sea level (MSL).

9. Both water shortage and irregular supply were experienced between 1986 and 1993. The *kanna* (cultivation) meetings for each tract helped to ensure better release, distribution,

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<sup>1</sup> Refers to the actual area to be developed and not the gross area to be irrigated.

<sup>2</sup> The water year begins in March and ends in the following February.

<sup>3</sup> Reduced rainfall experienced between 1986 and 1987. It was followed by good rain in 1988. Drought progressed in severity between 1989 and 1993, with 1992 being the most affected year.



and use of water. Field channels with a large number of outlets in the well-drained soils experienced difficulties in meeting irrigation needs under the rotational irrigation practice. The adoption of "variable discharge-fixed period" was not successful as the turnout attendants were obliged to deviate from the schedules prepared by DOI to meet the need of each individual field canal based on ad hoc interventions. Another reason for this was the inadequate cooperation from the field channel groups, particularly the tail-enders. This was also due to the Project's failure to provide for prior discussions and agreement on water rights and allocation policies and practices between the old and the new areas'. The complicated water issue timetable followed by DOI contributed to this problem.

#### **b. Establishment of Farmer Organizations**

10. Efforts to create farmer organizations (FOs) were initiated in 1986. The Irrigation Management Division (IMD) appointed two Project Managers to facilitate the creation of FOs. Various water user groups such as the Field Canal Groups (FCG) and Distributary Canal Organizations (DCOs)<sup>2</sup> were organized by IMD under the Project. The required operational and institutional linkages were set-up among the groups. In all, 761 FCGs and 60 DCOs, equally distributed between the old and the new areas, were established. Lack of an adequate linkage between the farmer representatives and farmers in general was a major weakness initially. The issue of non-resident settlers in the New Irrigation System (NIS) areas has accentuated the problem. To address such problems, four Subproject Committees and one Project Management Committee (PMC) were established. PMC consisted of FOs and Government officials. With the discontinuation of Project Coordination Committee (PCC), PMC has been institutionalized to coordinate Project activities. The Project Completion Review (PCR) Mission, which attended one of the PMC meetings, found that PMC is working satisfactorily. DCOs also executed about 391 small-scale contracts supportive of participation and accrual of benefits. FOs were active in below drainage channel system maintenance but were not interested in taking over operation and maintenance (O&M) of drainage canals. Awareness among farmers of the functions of these committees has increased in the recent past. Laws have been changed, giving FOs greater recognition and legitimacy. FOs should be strengthened through greater involvement of farmers. The extension of FOs mandate is also necessary. These are necessary to ensure sustainability of the Project through the active and continuous involvement of the beneficiaries. The Subproject Committees and PMC can be made more effective if their decisions relating to seasonal plans, including water allocation, are implemented by the agencies concerned. Simultaneously, the IMD setup in the Project area needs to be strengthened.

#### **c. Irrigation Systems Operations**

11. A marked difference between water duty<sup>3</sup> in the old and new irrigable areas was observed. While the water duty was 2.4 acre feet (acft)/acre in the old area, it was 8.5 acft/acre

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<sup>1</sup> Details on water allocation and release procedures are in Appendix 6.

<sup>2</sup> The allottees of each field channel constitute the field-channel group and have a leader. The leaders of the field channels within the distributary canal constitute a DCO with elected office bearers. DCOs have responsibilities for water management within field channels, maintenance of the irrigation subsystem, preparation and implementation of the agricultural program and other activities.

<sup>3</sup> Water duty is defined as quantity (volume) of water needed for optimal irrigation including losses per acre.

in the new area. Additional water received from the drainage of the new area and surface runoff from its own catchment have been attributed to reduced duty in the old area. Although high compared with the standard duty estimate of 5 acft/acre, the duty level of 8.5 for new irrigable areas to begin with, and under Project terrain conditions, may not necessarily be high. With continuous irrigation over a period of time, the water duty level could be reduced. Nevertheless, there is a need for the Project to address this issue in relation to feasible technical options and to take remedial measures.

12. The average irrigation efficiency<sup>1</sup> of the Project over a six-year period (1988-1993) was assessed at 47.3 percent against a simulated value of 44.5 percent for an inflow of 178 million m<sup>3</sup>. This was due to a considerable return flow from the new area and the efficient procedure adopted by DOI to use rainfall by closing the distributary canals. Another noticeable development was the rapid increase in the shallow dug wells in the Project area each irrigating about one eighth of an acre. As against two dug wells owned by two farmers in 1991 *yala* season, the number had increased to 405 owned by about 200 farmers in 1995 *yala*. This was due to the more than expected level of seepage water.

13. The drainage assessment indicated that while the drainage water from tracts 1 and 2 of RB and 1,2, 3 of LB flows back to the Ellegala tank systems, the same in respect of new area tracts 5, 6 and 7 flows to the sea. The inadequate maintenance of the secondary drainage channels in the Project area (both old and new) is causing salinity. The secondary drainage channels, which run between two D-channels, cannot be assigned to FOs for maintenance. Therefore, DOI has to take the maintenance responsibility. DOI needs adequate budget allocations for such maintenance work.

14. A comparative analysis of puddling<sup>2</sup> revealed a significant divergence between design parameters and actual requirement. For example, the actual water requirement for drainage channel 2 during *yala* 1989 was found to be 800 mm against the design estimate of only 350 mm, and the actual number of days required for puddling was 38 against the design provision of 30 days.<sup>3</sup> IMD, in consultation with FOs, need to ensure adherence to the seasonal cropping calendar, better coordination of inputs, and availability of credit to reduce land preparation time and eventual water requirements.

### 3. Settlement of Farmers

15. Development activities and the settlement of people were undertaken simultaneously under the Project. This was done as per advanced alienation policy.<sup>4</sup> Against the original target of 8,320 farm families, the number settled was 4,924 (3,630 Phase I and 1,294<sup>5</sup>

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<sup>1</sup> Defined as percentage of irrigable area developed for irrigation multiplied by the percentage of irrigation intensity (cropping intensity per cultivation season).

<sup>2</sup> Includes land preparation, land soaking, and the process of preparation for sowing.

<sup>3</sup> The International Irrigation Management Institute (IIMI) Report refers to design provision of 15 days based on a single stagger (phased land preparation). The same design specification will amount to a 30-day period for land preparation in a turnout area.

<sup>4</sup> Undertaking of development activities simultaneously with the settlement of people.

<sup>5</sup> Against a 1986 appraisal estimate of 4,500 families because of a water problem.

Phase II). The settlers were of two types, i.e., alternative settlers comprising people affected by the Project and open settlers representing landless people from the surrounding areas. The families affected by the siting of the reservoir were accommodated in the settlements except those who did not satisfy the income criteria. The initial assistance in cash and kind and infrastructural support had considerable impact on the settlers.<sup>1</sup> The housing loan assistance was inadequate to build permanent houses. Recovery of the housing loan was very poor. Repayments were affected by lack of continuous cultivation. The initial friction on water allocation between old area farmers and the settlers was evident; however, such friction was minimized over time through the organization of FOs and PMC. The demarcation of allotments was reported to be deficient in 37 percent of the settlers. Migration by the open settlers gave rise to the problem of nonresident settlers impacting on the proper utilization of certain Project facilities, e.g., irrigation, health, etc., built under the Project. The cancellation of such plots of nonresident allottees thus needs to be addressed. The Government's stated policy of providing user rights to settlers was not implemented. Selection of settlers with previous involvement in paddy cultivation only and other occupations impeded the realization of the Project objectives. The settled families benefited from the various Project components, e.g., roads, drinking water, health, education, forestry, etc. In some cases, however, e.g., livestock and credit, the benefit was limited. No significant change in socio-economic relations between landowners and tenants or landless laborers in the old area was noticed.

#### 4. Agricultural Development

16. An annual incremental paddy production of 44,000 tons (t) and output of 11,400 t of other field crops (OFC) were estimated under the Project. Currently, the estimated incremental production of paddy was 24,000 t (55 percent) and that of OFC was 2,800 t (25 percent). The principal features of agricultural development under the Project were (i) the considerable variation between seasons in the extent cultivated in the new area compared with the constant position in the old area, (ii) significant impact of water availability on the area cultivated and the type of crop, (iii) a trend of increasing OFC cultivation during water shortage period and a reversed trend with greater availability of water, (iv) a significant improvement in cropping intensity in both the old and new areas (195 percent), (v) a significant change in the extension system, and (vi) poor performance of state-sponsored marketing arrangements.

17. Consequent to the construction of facilities under the Project, the farmers in the old areas received water regularly both in *maha* and *yala* seasons. Prior to *maha* 1993/94, the new areas received water mainly during *maha* because of inadequate availability of water. Thus, paddy cultivation was predominant. Although paddy yield per acre in the old area increased by about 50 percent compared with the pre-Project situation, it is still short of the full potential by about 25 percent.<sup>2</sup> No significant difference in paddy yield between the old and new areas during *maha* 1994/95 (3,706 kg/ha in the new and 3,649 kg/ha in the old) was noticed. Considerable variation was observed in OFC cultivation. The OFC cultivated area was reduced to about 100 ha,<sup>3</sup> compared with an average of 1,000 ha during 1991-1993. The reasons for slow progress in OFC cultivation were the farmers' preference for paddy cultivation, the poor

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<sup>1</sup> Details as to basic facilities and support assistance are in Appendix 7.

<sup>2</sup> The potential yield of KOISP is estimated at 4,800 kg/ha.

<sup>3</sup> Excluding banana.

quality of soil (heavy) in the old area, unsuitability of certain tracts or portions thereof (part of RB tracts 1,2, and 5), problem caused by unregulated cattle grazing in RB tracts 6 and 7, deficient implementation of the floor price for OFC, and the significant price fluctuations due to the open market policy. These indicate that with improved water availability and management, the full potential of the Project can be attained or exceeded in respect of paddy cultivation. Some progress is also possible with regard to OFC, subject to corrective actions. In spite of the favorable development and prospect, *chena* cultivation during *maha* by the farmers within the Project area continues because of income considerations.

18. Besides the critical input of water, the above assessment significantly depends on efficient agricultural extension services. Changes in arrangements relating to agricultural extension services significantly impaired the extension efforts.<sup>1</sup> The current extension service policy focusing on FOs needs to be implemented efficiently. The field extension services with regard to the Project need to be strengthened and made more efficient, effective, and regular.

## 5. Drinking Water Supply

19. The original design stipulation for dug wells was replaced by the pipe-borne domestic water supply scheme because of the drought situation. Initially, only 37 dug wells were constructed. The National Water Supply and Drainage Board was the Executing Agency. About 2,000 m<sup>3</sup> of water per day is currently being supplied with a flat charge of SLRs11/month per family. About 5,000 families are being served through 450 stand posts. Domestic connections within the hamlets stood at 175 as against the capacity of 1,200 individual connections. In addition, connections were established in 21 schools, 23 Government offices, and 15 commercial establishments. About 50 percent capacity was being used. Cost recovery was introduced; however, only marginal costs of O & M were collected. The Board, on average, spent SLRs325,000 per month for O&M of the facility during the first five months of 1995. The average collection per month was SLRs155,000 or 48 percent.<sup>2</sup> The Government undertook to review the current water charge rates to increase the same to a reasonable level. Water consumer organizations were set up. The percentage of households using well water and piped water increased from 80 to 96 in the old area and from 64 to 81 in the new area between 1991 and 1994. The system was found to be maintained properly and functioning well during the Mission's field visit.

## 6. Social Forestry

20. Included under Phase II, the social forestry component was executed by the Department of Forests (DOF). The actual number of plants raised was above a million or 30 percent of the estimate. Between 1986 to 1993, 611 acres were planted by 441 families under the woodlot component. These represented 61 percent of the projected area and 70 percent of the intended families. The Government's inability to grant usufruct rights and long-lease agreements (up to 25 years), the timely supply of plants, and the preference of farmers for paddy

<sup>1</sup> The IIMI Report indicates that about 51 percent of farmers had no contact with extension workers in 1993.

<sup>2</sup> Collection was as follows based on the nature of services: (i) domestic - 25 percent; (ii) stand posts - 43 percent; (iii) commercial - 20.6 percent; (iv) Government establishments - 8.5 percent; (v) religious organizations - 2.6 percent; and (vi) industries - 0.22 percent.

cultivation were identified as reasons for such poor showing. It was observed that the woodlot program has not come up to the expected level because of lack of adequate supervision and monitoring. Out of a total of about 4,200 households to be covered under the home lot program, about 15 percent were found to be absent or uninterested. The program progress per se was also not satisfactory. The successful planting of roadside avenues (44 km between 1986 and 1991 against the target of 36 km), carried out by farmers on a self-help basis, was a positive development. DOF was found to support the program through allocation of funds and institutional support even after the termination of the Project. Such efforts need to be augmented in the Project area through replication of the approach under the Bank-financed Participatory Forestry Project.<sup>1</sup>

## 7. Livestock Development

21. The omission of the livestock component in the original design was a failure since the area was traditionally important for raising cattle and buffalo. Phase II design took note of this and made provision for it. Even though the implementation performance of the livestock component was a mixed one, its relevance and prospect for further development continue to be high. The envisaged development of 1,000 ha for livestock and agroforestry failed to contribute effectively to the development of the livestock industry. Only about 5 percent of the settlers adopted livestock raising on a small scale. The timely supply of 25 purebred stud bulls was affected by the civil disturbances of 1989. Through the system of "board and lodging" and "tract breeding," the imported stud bulls provided services, producing 367 and 927 calves, respectively, between 1991 and 1995. The supply of 2,800 local female cows and 400 local buffalo heifers also suffered because of policies and other constraints including water shortage. Incremental milk production was 2.6 million liters as opposed to the estimated 4.1 million liters. While the marketing of buffalo milk has improved significantly, the marketing of cow milk remains a problem because collection centers are located at a considerable distance.<sup>2</sup> Four Cattle Owners Farmer Organizations (COFOs) were formed between 1993 and 1995. Three are in LB and one in the old area. Their principal functions are milk collection, attending to crop damage issues, and securing suitable grazing lands. COFOs need to be supported to ensure the attainment of their objectives. The Mahaweli Draft Animal and Dairy Development Program (MDADDP) has taken action for collection of milk from COFO centers for its own use (an ice cream factory was established recently) or for marketing of such milk. Extension and veterinary services have improved. There is a good prospect of improving goat farming in the Project area. Some efforts are being made by MDADDP to popularize it. Extension services being rendered through the Livestock Development Division consist mostly of deworming of animals, vaccination, upgrading, straw treatment, and training of personnel.

## 8. Credit Support

22. The Central Bank of Sri Lanka (CBSL) designated the Bank of Ceylon (BOC), the People's Bank (PB), and the Regional Rural Development Bank (RRDB) to function as participating credit institutions in the Project area. The Project envisaged the provision of 300 two-wheeled tractors and implements to farmers under a credit scheme. In addition, CBSL was

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<sup>1</sup> Loan No. 1183-SRI(SF): *Participatory Forestry Project*, for \$10.5 million, approved on 5 November 1992.

<sup>2</sup> The quality of cow milk deteriorates when it is transported over long distances by motorcycle.

to ensure that the needed credit requirements for paddy/OFC cultivation and the development of livestock were met through normal credit schemes. While this was generally achieved, a lack of demand for institutional credit for the livestock component was observed. The procurement status of tractors, equipment, etc. is given in Appendix 8. The lower than targeted procurement of tractors was attributed by CBSL to the favorable financing terms under another Bank-financed loan,<sup>1</sup> which covered the Project area. Tractor loan recovery was 98 percent for PB, 88 percent for BOC, and 47 percent for RRDB. The lower recovery rate for RRDB was due to initial institutional weaknesses. Field interviews confirmed that institutional credit for farm activities are available; however, the process is slow.

## **9. Other Infrastructure Facilities and Services**

23. The Project provided for a number of infrastructure facilities and services. Evaluation of their implementation performance is dealt with below:

### **a. Education**

24. The Project established 20 primary schools in hamlets and 4 junior and secondary schools in the new towns. Because of the Project schools, the type and volume of educational infrastructure and facilities witnessed significant improvement. The literacy rate in the Project area increased from 85 to 96 percent during 1981 to 1989, compared with the respective national levels of 87 and 89 percent. Literacy increased faster in the new area than in the old area and was greater for women. Farmers, students and teachers expressed favorable opinions about the Project school although there is need, for further improvement. The shortage of teachers and subject matter specialists, inadequacy of school buildings, overpopulated classrooms, and inadequacy of equipment were some of the current problems. Science laboratory equipment supplied to Project schools visited was found to be used.

### **b. Health**

25. The Project focused on improving health facilities by establishing a district hospital at Lunugamwehera supported by three health centers in the new townships. It also supported malaria eradication. A sample survey,<sup>2</sup> reported that 70 percent of the people in both the old and new areas expressed satisfaction with the level of services. The shortage of drugs and medical staff were identified as reasons for dissatisfaction, particularly in health centers. The cleanliness, maintenance, and service quality of the district hospital were good. However, it was observed that the maintenance of Weerawila health center at RB<sup>3</sup> was poor. The Mission witnessed a regular and extensive mobile program for malaria identification through blood screening and administration of drugs in affected cases. Undernutrition appears to be an emerging concern.

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<sup>1</sup> Loan No. 993-SRI(SF): *Agriculture Rehabilitation Project*, for \$22.2 million, approved on 28 November 1989.

<sup>2</sup> Conducted by IIMI.

<sup>3</sup> The health center located at Weligatta (RB) was not functioning as the township has not developed yet. The same in Berelihela (LB) is reported to be functioning, but lacks electricity.

### **c. Road Network**

26. The Project constructed 453 km of roads. These comprise (i) 165 km field canal (FC) roads constructed by DOI, (ii) 250 km of internal roads constructed by the Land Commission's Department (LCD), and (iii) 38 km of link roads by DOI (subsequently handed over to the Southern Provincial Council).<sup>1</sup> About 96 percent of the houses in the new area and 93 percent in the old area are accessible by vehicles. The Provincial Council is responsible for maintaining link (metaled and tarred) roads, while LCD is responsible for internal roads within the hamlets. FC roads are maintained with FOs participation. Some of the Project roads have developed potholes. They need to be repaired quickly to arrest further damage.

### **d. Cooperative Stores**

27. Of the 24 stores constructed and handed over to two local cooperative societies, 18 are operational but eight are running at losses. This was due to the open market policy, the existence of nonresident settlers, theft, and bad locations. It is expected that with the two-season cultivation becoming a reality and consequent to actions being taken by LCD for cancellation of plots, the nonresident settlers will be motivated to settle down. This may improve the functioning of cooperative stores within the Project area.

### **e. Produce stores**

28. Including ten constructed earlier as World Food Programme stores, 23 buildings were allocated in the different hamlets to be used as produce stores. Their main purpose is to facilitate the storage of inputs. Only two have opened recently. The operational performance was poor for the same reasons as for the cooperative stores. Alternative use, including the holding of classes for overcrowded schools, is being explored.<sup>2</sup>

### **f. Community and Agrarian Service Centers**

29. Twenty-two community centers (CCs) and four agrarian service centers (ASCs) were established in the new area. CCs are being used for a number of community activities. Although open market operations impacted on the usefulness of ASCs to assist settlers by obtaining input requirements, they are needed by the settlers for multifarious purposes. Those visited by the Mission were found to be properly maintained.

### **g. Post Office and Police Station**

30. The people also benefited from the establishment of four new sub-post offices and one police station.

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<sup>1</sup> The provincial council is synonymous with the provincial government.

<sup>2</sup> LCD handed over two such stores (one in hamlet 1&2 of LB and another in hamlet 4 of RB) for the holding of additional classes.

## **h. Relocation of Elephants**

31. Free-ranging elephants tend to destroy farm products in the Project area. The design of Phase II thus emphasized the establishment of the Lunugamwehera National Park in the Project area as well as the undertaking of measures for the protection of wild fauna. The Department of Wild Life Conservation (DWLC) was the Executing Agency. The electric fencing of the proposed Lunugamwehera Park area was not completed by DWLC.

## **i. Training and Research Facilities**

32. Facilities in Weerawila District Training Center (DTC) and the Agricultural Research Unit (ARU) were well-constructed. Structures were maintained adequately. DTC conducted residential and nonresidential training programs for farmers. The general maintenance of the other facilities, relevance of demonstration farms, and the focus of training courses in DTC need improvements. The research program comprised trials in the farmers and research fields with the objective of improving production, cultural practices, and farming systems to increase cropping intensities. Field visits also revealed a deficiency in research activities. The research activities of ARU, therefore, need to be strategically aligned and augmented. The sanctioned staff strength of ARU, in addition to the officer-in-charge, includes two research assistants. Both positions are vacant. The facility is not being properly used.

33. The accompanying advisory technical assistance (TA) for the institutional strengthening of the Department of Irrigation (DOI) provided for international and domestic expert services to enhance training capacity, to revise departmental procedures and manuals and to strengthen the organizational structure of DOI. The TA contributed to an overall institutional perspective to training in DOI in terms of needs, priority, and planning. It facilitated the undertaking of training activities in a systematic manner. Training programs were developed, materials and brochures printed, and organized training of DOI staff undertaken. A number of training-related recommendations were implemented. The implementation of the training component of the TA was rated as successful. DOI was happy about the impact of the TA. The institutional support component was undertaken through three local institutions. This was also rated as satisfactory. Some institutional recommendations, particularly those related to finance and accounting, were implemented and others had been taken into account in preparing the recent reorganization plan to restructure DOI (the plan to restructure DOI has been approved and is being implemented). The relationship between the international and domestic consultants and DOI was rated cordial and satisfactory.

## **B. Implementation Arrangements**

34. Three concerned line departments were actively involved in the implementation of the Project. They are (i) DOI responsible for dam and irrigation works (Part A), consultants' services and training (Part D), and O&M equipment (Part E); (ii) LCD for land settlement works (Part B);<sup>1</sup> and (iii) Department of Agriculture (DOA) for agricultural development component (Part C). DOI functioned as the principal Executing Agency. The budget requirements of LCD and DOA for the Project were channelled annually through DOI. The coordination arrangements

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<sup>1</sup> Originally, the Land Development Department (LDD). LDD was absorbed by LCD in 1981.



under the Project were carried out through the Central Coordination Committee (CCC) and the Project Coordination Committee (PCC) at the Project level, which met regularly.<sup>1</sup>

35. A Project Office was established at Tissamaharama headed by a Project Manager (PM). DOA and DOI assigned project officers-in-charge for their respective components. During appraisal in 1982, modifications were made. Two project offices, one for irrigation in the Territorial Civil Engineering Organization and one for settlement in the office of the Additional Government Agent (GA) were set up. The Chief Resident Engineer at Tissamaharama was designated as PM for irrigation and the Additional GA was designated as PM for settlement. The Senior Deputy Director (Major Construction) of DOI was designated as Project Director to supervise PM (Irrigation) and to liaise with PM (Settlement). This arrangement was continued during Phase II. A tabular presentation reflecting coordination and implementation arrangements by phase is in Appendix 9.

36. Phase I provided for built-in monitoring arrangements with respect to Project implementation performance, benefits, and evaluation. The Agrarian Research and Training Institute (ARTI) had the responsibility for baseline, midproject, and postproject surveys in addition to undertaking specific studies. The program also had provision for staff development and study visits abroad for monitoring and evaluation team members. As per recommendations of the Bank's June 1992 Review Mission, it was agreed to undertake a comprehensive benefit monitoring study. The study was undertaken<sup>2</sup> in 1993 by IIMI in collaboration with ARTI. The Report, finalized in February 1995, was helpful in highlighting the Project's achievements and shortcomings.

### C. Project Costs and Financing

37. The total estimated cost of KOISP was \$66.8 million. Subsequent to the approval of International Fund for Agricultural Development (IFAD) loan<sup>3</sup> of \$12.0 million, the Bank loan of \$24.0 million from its Special Fund resources to finance the entire foreign exchange cost was reduced to \$20.0 million in August 1978. In October 1979, Kreditanstalt für Wiederaufbau (KfW) approved a loan of \$13.3 million to meet the additional cost. Thus, the total external financing of KOISP stood at \$45.3 million. The share of Government financing was reduced to \$23.3 million equivalent for local costs financing from the original figure of \$42.8 million.

38. After reformulation, the total cost of Phase I was estimated at \$79.8 million. The additional financing need was met through supplementary financing from the Bank, IFAD, and KfW, besides the Government. The total Project cost related to Phase II was estimated at \$33.1 million. This was financed by the Bank<sup>4</sup> and the Government. A tabular presentation of the financing plan for KOISP, supplementary financing plan for Phase I, overall financing plan for Phase I, financing plan for Phase II, and overall financing plan for Phases I and II is in Appendix 10. The actual cost of the Project was \$99.3 million equivalent compared with the appraisal estimates of \$127.9 million.

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<sup>1</sup> CCC met twice and PCC met 19 times between 1992 and 1994. PCC was discontinued in June 1993.

<sup>2</sup> Under Technical Assistance Agreement between the Bank and the Government, using funds under Loan No. 794-SRI(SF): KOISP (Phase II).

<sup>3</sup> The IFAD loan was jointly cofinanced and administered by the Bank. The KfW loan was on the basis of parallel cofinancing.

<sup>4</sup> The loan was denominated in SDRs and was the equivalent of \$26.6 million at approval.

39. The expenditures for Phase I were close to estimate; however, \$15.267 million had to be cancelled under the Bank loan for Phase II. This was principally due to the appreciation of SDRs in terms of the dollar, depreciation of the Sri Lankan rupee, and the decision not to proceed with certain Project activities, e.g., LB main/branch canals, tract development, collector drains, etc. The revised financing by the Government was estimated at \$10.9 million equivalent for Phase I and \$6.5 million for Phase II. These were fully spent.

#### **D. Project Schedule**

40. The planned and actual implementation schedules are in Appendix 11. The original implementation schedule of KOISP became redundant in view of the subsequent developments culminating in its rephasing. Against the stipulated time of 3.55 years, Phase I was implemented in 6.55 years, a time overrun of about three years. The experience with Phase II was similar with a time overrun of about 100 percent in relation to the original implementation period of 4.75 years.

#### **E. Engagement of Consultants and Procurement of Goods and Services**

41. Consulting services were procured from international firms under KOISP and Phase I. Individual international consultants were engaged during the implementation of Phase I in response to Project needs and with the approval of the Bank. In addition, an individual consultant for the construction management study was recruited under Phase II. A limited number of domestic consultants were also engaged. All such consultants were engaged in accordance with the Bank's *Guidelines on the Use of Consultants*. Local contractors were used for civil works, but because of their less than satisfactory performance, some civil works were assigned through local competitive bidding (LCB) procedure to selected foreign contractors working in Sri Lanka. In a number of cases, uncompleted works of contractors were undertaken by force account by the Executing Agencies concerned. Civil works were also partly carried out under LCB contracts and force account, employing labor-intensive methods. International competitive bidding/international shopping procedures were used to procure equipment.<sup>1</sup> Some of the equipment procured under Phase II were inspected by the Mission and found to be in good condition and being used for the Project. The Project experienced delays in the recruitment of consultants and also in the procurement of goods and services. The Executing Agencies considered that the time frame for related actions was inadequate. The Mission noted, and the Executing Agencies agreed, that most of the delays experienced in the procurement process were attributable to related Government policies and procedures and that the construction undertaken through subcontracting needs to be counterchecked to ensure the quality of the civil works.

42. A listing of consulting services provided under KOISP and Phases I and II with allocations in relation to expertise and actual utilization is in Appendix 12. Services were provided for design and construction supervision, implementation, monitoring, and institutional strengthening of the accounting system in DOI. Such services were procured from international consultants except those related to monitoring and accounting. There was a gross underprovision of consultancy input under KOISP, particularly with respect to design,

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<sup>1</sup> A list of equipment and vehicles procured has been compiled and kept in file.

construction supervision, and implementation assistance. This was partly rectified during re-appraisal of Phase I and subsequent actions of the Government through addendum and variation orders. As against the original 88 person-months and about 300 person-months of services envisaged under Phase I, the Project utilized 420.5 person-months. Technical problems encountered also increased the need for additional services.

#### **F. Performance of Consultants, Contractors, and Suppliers**

43. Most of the services rendered were useful although the Government had reservations about the usefulness of some specific services such as the preparation of the O&M manual for water management, specification of tract and pneumatic wheeled drilling machines for dam work, design of system simulation program, and recommendations with respect to construction management. Their effectivity in some cases was impaired because of inadequate appreciation of local conditions and too much emphasis on conservative designs. The Government appreciated the services rendered by local accounting consultants. The difficulties experienced in executing most civil works were, among others, due primarily to the poor performance of the contractors. In a number of cases, the Government advanced funds to the contractors to overcome liquidity problem. Without such assistance, most of the major contractors would have failed to achieve what they did. The performance of some of the subcontractors had not been satisfactory either. The performance of the suppliers of equipment and vehicles was satisfactory. The arrangement of dry lease of equipment to the contractors on higher charge basis worked well.

#### **G. Training**

44. Phase I of the Project provided for overseas training of nine months for the agricultural extension staff and six months for the research staff. This was achieved during the implementation of Phase II. Phase I also envisaged in-country training for farmers. The training center of Angunakolapellessa organized 63 training courses between 1983 and 1986 and trained 2,609 farmers. The DTC at Weerawila gave training in various agricultural practices to 1,327 participants, including farm leaders and young farmers, between 1986 and 1988. Phase II provided for 64 person-months of overseas and 19 person-months of local training. Keeping the Project requirements in view, the overseas training of 28 person-months and local training of 103 person-months were accomplished under Phase II with changes approved by the Bank.

#### **H. Conditions and Covenants**

45. The loan conditions and the covenants sought to ensure effective implementation and management of the Project. Most of the major covenants under the loans were complied with. Some were complied with after some delays, while some others were not complied with (Appendix 13).

#### **I. Disbursements**

46. A total of \$29.5 million from the Bank loans, \$16.0 million from IFAD loans, and \$20.9 million from KfW loans were disbursed as of 13 October 1989 with respect to Phase I. An additional amount of \$15.473 million was disbursed as of 10 January 1995 under a separate Bank loan for Phase II of the Project. The first disbursement from the Bank loan was made on

30 September 1979 (16 months after the Bank loan became effective). Delays in disbursements were due mainly to the implementation problems experienced by the Project. Cofinanced loans experienced identical delays in disbursements.

## **J. Environmental Impact**

47. Through the Project's intervention, some negative environmental impacts have been ameliorated while some positive environmental impacts have been generated. The Project's major environmental impacts were those associated with the construction of the dam, creation of the reservoir, appurtenant structures, construction of roads, and the water supply system. The dam, reservoir, and appurtenant structures caused disturbances in the ecology of the natural lagoon systems<sup>1</sup> in the lower coastal plains consequent to the altered hydrology of inflow from NIS. A major section of the Bundala lagoon is a natural habitat for fish, birds, and other wildlife. With the deletion of RB tracts 3 and 4 from the scope of the Project, the present environmental regime of the lagoon has been retained. No adverse impact is likely unless new irrigation development plans in RB tracts 3 and 4 are implemented. Field interviews indicate that both Malala and Embilikala lagoons suffered negative impacts due to the Project activities. The additional inflow of freshwater into the lagoons reduced the salinity to suboptimal levels, impacting on natural prawn production. The Mission visited the Malala Lagoon canal outlet constructed in 1993 under the Project. It improved the environment by the planned discharge of diluted drainage water from Malala and Embilikala Lagoons to the sea, contributing to the culture of other species of fish that obtain high market prices. O&M of the canal was assigned to the local fisheries cooperative. The canal is well maintained; its future maintenance will be facilitated through better monitoring by DOI.

48. The salinity impacts in the command area of the Old Ellegala Irrigation System (OEIS) and soil erosion and silting of the natural drainage waterways within NIS are two other issues related to environment. The salinity impacts are more predominant in OEIS. This is due to the leached out soluble salts from NIS that are deposited in four major tanks that service OEIS. Because of inadequate drainage, OEIS serves as a sink for additional salt in addition to normal cyclic salts and other accretions. Consequent to change in the hydrology of the lower floodplain and the command area of OEIS, both the water level and the quality of water of the homestead wells were affected. This is the result of both improper functioning of some drainage ways and the purposeful blockade caused by unauthorized cultivators. Also, the inability to discharge drainage water in the sea because of the lower drainage channel level in the old area of LB has significantly affected the adjacent cultivation area (about 400 ha). Field visits confirmed that the affected areas are gradually increasing. Salinity is minimal in NIS and has been found to be localized. Soil erosion in NIS has been minimized as a result of terracing for wet paddy cultivation. Full establishment of the National Park at Lunugamwehera would prevent damage through soil erosion and help rehabilitate the watershed. No evidence of heavy siltation was observed in the Lunugamwehera reservoir during the drought of 1992. Neither was major silting observed in the first-order and second-order drainage ways; however, silting has been found to be substantial in higher order drainage ways. Land leveling and clearing for the purpose of development of irrigation had no adverse environmental impact because more productive and sustainable new tree species were planted in the affected areas. Although most of the road civil

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<sup>1</sup> The lagoons involved were the Bundala, Embilikala, and Malala.

works involved construction of new roads, the impact on the environment was minimal. Most of the roads followed field channel tracts. The piped domestic water supply system and the improved latrine component substantially helped enhance the environmental impact. The use of agrochemicals (e.g. urea, phosphates, potash, weedicides, fungicides, pesticides, etc.), being applied at recommended levels is increasing in the Project area and is causing water pollution. The increased flow of such water, particularly from the new area to the lagoons and tanks, is a matter of concern.

## **K. Project Benefits**

49. The Project, in addition to providing direct benefits,<sup>1</sup> has also generated both indirect as well as intangible benefits. The recalculated EIRR for the Project is 6.3 percent based on actual costs and estimated benefits worked out at 1994 constant prices. It was expected that a major proportion of the direct benefits of the Project would be derived from increased agricultural output, increased cropping intensity, improved yields, and diversification from paddy to more remunerative crops. However, the achievements were below expectation with noticeable improvements noted recently. As of 1993, the annual incremental production of paddy was 55 percent of the target and that of OFC was 25 percent. The cropping intensity in the old area was 160 percent and that in the new area was 90 percent. These were 95 percent and 53 percent of the targets, respectively. Farm incomes have not risen with the implementation of the Project. This is principally because of the steep rise in input prices and the lower than projected level of OFC cultivation. Besides the factor of drought, a Project of this nature would require a considerable period of time for stabilization and achievement of full benefits.

50. The improved weather conditions in the last three cultivation seasons (1994 *yala*-1995 *yala*) have had a marked impact on production. Almost the entire developed area (9,600 ha) was cultivated in the last three seasons. Cropping intensity increased to 196 percent in the old area and 185 percent in the new area in crop year 1994. While average yields remained at around 3.6 t/ha, the total production of paddy increased from about 45,000 t in 1993 to 66,800 t in crop year 1994. The total paddy production is expected to be 31,600 t in 1995 *yala* alone. However, the area under OFC has declined to around 100 ha because of increased water availability and the preference of farmers for paddy cultivation under such circumstances. Better utilization of the highlands, expansion of banana cultivation, intensive dairying, poultry and goat raising, and better management of woodlots and home lots will increase the incomes of farm households and improve Project returns.

51. Various infrastructure facilities were provided under the Project. The provision of a drinking water supply, in addition to reducing health problems, has reduced by about 30 percent the women's time in fetching water from distant sources. The construction of Project roads, in addition to reducing transport cost and losses of produce, has also helped to reduce the time spent in traveling. The roads made access to markets and infrastructure facilities easier. Communications improved significantly. Outpatients treated by the Lunugamwehera hospital increased from about 75 to 200 per day over the last few years. Also 40 beds are available for in-hospital treatment, including maternity services. The improved functioning of health centers

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<sup>1</sup> Figures related to benefits quoted in this Report were mostly based on the IIMI study. In relevant cases, adjustments were made based on field visits.

will improve the related benefits. Project schools are operating efficiently. The literacy rate has improved significantly, more so in the case of girls. The community service buildings, post offices, police station, agrarian service centers, cooperatives, and shop buildings have also contributed to Project benefits. The expansion of inland fisheries (with an annual incremental value of SLRs5 million) was a major indirect impact of the Project. Business activities expanded rapidly and are estimated to have increased fourfold (of a total of 644 business establishments, 516 were established after the Project). This provided substantial employment opportunities to local people. Tourism in the area has been boosted by the year-round water availability in the tank, which have become ideal locations for tourist hotels and resorts.

52. During the construction phase of the Project, about 7.2 million person-days of employment were created against an estimate of 6.2 million person-days. However, the participation of the local residents was limited to 12 percent of skilled labor and 27 percent of unskilled labor. Additional employment created through agricultural activities was about 155,000 person-days per annum or only 20 percent of the target because of the shortage of water. The percentage of employment in the new area increased from 32 (1986) to 71 (1994) percent. Expansion was less in the old area: from 29 to 63 percent over the same period. More than 50 percent of the teachers employed in the schools in the Project area were local residents, the bulk of whom (61 percent) were women. The formation of FOs and PMC with the participation of farmers helped to reduce the conflicts and improved water distribution as well as cultivation planning and implementation. The participation of farmers in the maintenance of the system has helped to build farmer confidence and improve their management capacity.

53. The major negative impacts of the Project relate to the estimated yield reduction of between 0.5 to 1.5 t/ha in the saline-affected areas (400 ha) now estimated to be in the range of SLRs6 million to 10 million per annum and the annual losses to prawn fisheries estimated between SLRs3 million and 5 million. Inclusion of such measurable indirect impacts does not significantly affect the EIRR. Details pertaining to assumptions and EIRR calculations are in Appendix 14.

#### **L. Performance of Borrower and Executing Agencies**

54. Notwithstanding the history of the Project and the implementation delays experienced, the performance of the Borrower and the Executing Agencies was generally satisfactory. They complied with most of the major loan conditions and implementation arrangements for the Project. The Government was generally responsive to the need for adjustments in design and implementation arrangements. Likewise, the Executing Agencies also demonstrated flexibility in implementing the Project. Quick decisions on technical issues and prompt actions for issuance of variation orders and for retendering or direct negotiations<sup>1</sup> are some examples. However, in a number of other cases having considerable benefit and impact implications, the Borrower and the Executing Agencies performed rather poorly. Examples are (i) inability to provide land title and user rights to the settlers of the Project area, (ii) inadequate boundary alienation as to land allocated to settlers, (iii) insufficient interactions between

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For example, to ensure timely installation of rock bolts at the spillway, the Government, after initiation of pre-qualification exercise, directly negotiated the contract with the German joint venture Randenigala Civil Contractors J.V. (RCC) working at that time in the Randenigala Reservoir Project.

agricultural extension staff and farmers, and (iv) protracted contract approval policies and procedures.

#### **M. Performance of the Bank**

55. The integrated development of the dry zone was critical for Sri Lanka to accelerate the process of growth, to strike a balance in development efforts, and to ensure sustainability in the development process. This obviously could be initiated and augmented through irrigated agriculture and provision of supportive infrastructure facilities. The interventions through the Project were thus appropriate and timely. The Bank closely supervised the implementation of the Project through 36 Missions<sup>1</sup> between 1978 and 1994. The Missions assisted in the resolution of critical design and engineering issues besides issues that cropped up during implementation, particularly those related to the revision of the scope of the Project. They adopted a flexible approach to implementation in view of the nature of the Project. The missions, however, gave inadequate attention to details of settlement and agricultural development components. The Bank's suggestion to the Government and approval of the needed TA to examine the scope of and arrangements for phasing investments were timely and beneficial. The estimate of consultants' input and identification of their services under KOISP were deficient. Although this was rectified during the Project's execution, it left much to be desired. The Bank could have helped the Government significantly by assisting the Executing Agencies in establishing the need for consulting services in greater detail at the initial design stage and in clearly specifying the consultants' tasks in relation to the Project's execution. The decisions of the Appraisal Mission for Phase II to include livestock and forestry as separate components and the emphasis placed on issues of environmental concerns and benefit monitoring were of significant relevance. Although slow in starting, these new initiatives laid the foundation for improved development impact. The Bank's decision to undertake an independent impact assessment study also deserves mention.

### **III. CONCLUSIONS AND RECOMMENDATIONS**

#### **A. Conclusions**

56. The Project performance suffered from a number of factors as follows: (i) unusual prolongation of implementation period, (ii) low rainfall level and severe drought adversely impacting on water availability in the reservoir, (iii) lack of continuous impact monitoring, and (iv) high expectations created among farmers while the Project was being launched. The prolonged implementation time was due to factors unforeseen at appraisal stages. The inability to operate the Project in both *maha* and *yala* seasons from the beginning was due to natural causes that could not be foreseen. IIMI's study completed in March 1995 reported favorably on benefit assessment even though the revised estimated EIRR was less than what was projected earlier. Interviews conducted by the PCR Mission in the field with random farmers, other beneficiaries, FOs, and PMC generally conveyed a favorable response as to the Project's success and impact.

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<sup>1</sup> Reappraisal missions for Phases I and II were treated as Review Missions for this analysis.

57. With hindsight, it can be concluded that a project of this nature to include the construction of a dam and related system structures, and the settlement of people simultaneously was too ambitious. A stage-specific project design with proper linkage among stages and focus on capacity building would perhaps have delivered better results. However, the design of projects in the 1970s and early 1980s generally suffered from such deficiencies and this Project was no exception. Having said so, the PCR Mission concluded that in designing the Project, the Bank perhaps could have done better by taking a conservative view on some key issues related to design parameters. Examples are (i) the integrated approach in assessing water availability in the basin as a whole, (ii) not to locate the dam on the consideration of the command area and without adequate geological investigations, (iii) planning pertaining to OFC cultivation and their marketing prospect, and (iv) provision for dug wells as a source of drinking water supply without groundwater investigation. Likewise, the Bank should have given more attention to (i) institutional and capacity building during the implementation phase, and (ii) relevance of livestock and forestry in designing KOISP and Phase I.

58. Paddy cultivation after 1987 was successful with marginal differences between the old and the new areas in relation to potential. Because of terrain limitations on the cultivation of OFCs on the highlands, high capital and manpower requirements, vulnerability to cattle damage, marketing difficulties, and price fluctuations, OFC cultivation in the Project area mixed with paddy cultivation in lowlands during *ya/a* season will remain limited for some time. On an overall basis, paddy cultivation can be rated as generally successful. OFC cultivation can be considered unsuccessful at the present moment, but it has the elements to be partly successful in the future. Limiting the number of settlers to 4,924 was a rational decision, considering the water situation. The Project's positive contributions were in the areas of education, hygiene, health, transportation, income generation, business, and other occupational activities. The Government has agreed on a time-bound action plan with the PCR Mission. Most of the agreed upon actions would have impact on the sustainability of the Project. Thus, considering the implementation performance and the prospect for better results under the various components, the lower than projected level of EIRR, the measures provided in the action plan, and the considerable unquantifiable social benefits, the PCR Mission rates the Project as partly successful. Further action on the part of the Bank is needed to ensure the action plan is carried out.

59. During field visits, damage done by unregulated cattle grazing was identified as a principal concern. This needs to be tackled. Institutional organizations of FOs, sub-PMCs and PMC, established since 1986 and contributing significantly to capacity building, were a major success. Over time, FOs have gained legal status and organizational focus and strength to withstand outside pressures and dictation. The significant contribution of PMC was in minimizing friction among settlers of old and new areas and facilitating the proper functioning of the system. During discussions, PMC members generally rated the Project as partially successful with the prospect of becoming more successful. They observed that the Project did not live up to their expectation in terms of income generation. They also opined that this was not due to the fault of the Project design, but rather to a considerable rise in the cost of cultivation and the lower paddy price. The above assessment of PMC confirms the Mission's findings as to the partial success of the Project.



## **B. Recommendations**

### **1. Project-Related**

#### **a. Action Plan and Follow-up**

60. Despite implementation delays and difficulties, the Project has reached a stage where proper management of facilities built and their O&M with the help of FOs are likely to enhance benefits and ensure sustainability. The PCR Mission's assessment is that the Project's future success will significantly depend on the management, supervision, and coordinated operation of the Project facilities. For this purpose, the institutional framework of CCC needs to be continued. Keeping these in view and the objective of maximizing benefits and minimizing adverse impacts to ensure future sustainability of the Project, and in line with the PCR Mission's field visit, a time-bound action plan (Appendix 15) has been agreed upon with the Government. The follow-up on the action plan should be undertaken as part of the review of ongoing Bank-financed agriculture and social sector projects in Sri Lanka.

#### **b. Timing of PPAR Preparation**

61. The Project Performance Audit Report (PPAR) should be prepared at the end of *ya/a* 1997. This will give the Government time to implement the action plan. In addition, a reasonable spread of time is needed to determine the reliability of current favorable weather conditions. This will be helpful for better assessment of the Project's impact.

### **2. General**

62. While most of the delays under the Project were caused by numerous external and technical reasons, substantive delays were experienced because of the time needed to finalize the design and to meet cost overruns. The process was intermittent. It lacked a coordinated approach and concerted efforts. The preferred alternatives would have been completion of the detailed design based on detailed geological investigations and launching of stage-specific inter-related implementation plans. The Bank could have cofinanced such stage-specific components as either a sector or project loan.

## **C. Lessons Learned**

63. The Project implementation performance provides a number of lessons if any similar project is to be undertaken in the future. Specific lessons learned are as follows:

- (i) For a Project of this nature, particular consideration should have been given to a more thorough investigation of the dam site during the feasibility study, and the investment decision should have been preceded by detailed engineering design.
- (ii) In undertaking a project dependent on water resources, a comprehensive basin-wide examination of the resource potential including groundwater assessment, intermediate surface water storage capacities, and competitive demand on such resources should be made.

- (iii) The location of a dam site under any future similar project should emphasize a cost-effective approach rather than the objective of maximizing a new command area.
- (iv) Pre-project area-specific experiences and performance (such as livestock and domestic water supply components) should be given due consideration in the design exercise.
- (v) Consultation with and feedback from the local people should be ensured, with emphasis on their involvement in planning, designing, and implementation.
- (vi) In any project aiming at sharing of key input requirements as water, rights, policies and procedures should be explained to the beneficiaries, particularly of the existing areas, and settled before commencing implementation.
- (vii) Detailed soil investigation should be undertaken at the planning stage to establish the suitability of soils for any proposed cropping pattern.
- (viii) The proposal for growing OFCs should take into account the traditional cultivation priorities and practices of the farmers, investment and labor requirements, obtainability of economic market prices, vulnerability to external conditions, and the marketing mechanisms.
- (ix) Perceived institutional capacity is not sufficient for realization of benefits unless the same is accompanied by necessary implementation arrangements.
- (x) The staged settlement of people coinciding with completion of land development should be adopted as the policy of "advanced alienation" creates more problems than it resolves.
- (xi) Firmed up institutional arrangements in the design, with the representation of farmers, are necessary to lay the framework for the development of a season-specific cultivation plan in view of the critical dependency on water.
- (xii) Adequate emphasis should be given to train and orient farmers in the areas of cultivation procedures, crop diversification, and establishment and operation of FOs to enhance capacities.
- (xiii) Sustained independent monitoring of implementation performance and benefits, particularly from midstream of project implementation, would be a preferred option compared with an intermittent monitoring system including midterm evaluation and provision for unidentified specific studies.
- (xiv) An independent benefit assessment study, as was done by IIMI as a subsequent intervention, should be provided in the design.

# APPENDIXES

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## **LAND AREA, CLIMATE, HISTORICAL BACKGROUND, LOCATION, AND GOVERNMENT PRIORITIES**

### **A. Land Area**

1. The total land area of Sri Lanka is 6.6 million hectares (ha) of which about 2.24 million ha is under permanent cultivation. Of the total land area, about 70 percent receive an average annual rainfall of 890-1900 millimeters (mm) and comprises the dry zone. The dry zone mainly covers the north, the northwest, east, and southeast areas of the country.

### **B. Climatic Conditions and Agriculture**

2. Agriculture in Sri Lanka is predominantly influenced by climatic conditions. The climate is a tropical monsoon one. The average annual rainfall is about 1,000 mm of which about 760 mm falls in the wet season (locally called *maha*, signifying northeast monsoon) between October and March and 240 mm in the dry season (locally called *yala*, related to the southwest monsoon) between April and September. Rainfall during *maha* benefits the entire country. The mountains in the south central part of the Island intercept the rainfall during *yala*. Hence, the northern and eastern parts of the country are designated as the dry zone. The resource potential of such land, therefore, hinges significantly on the provision of sufficient and regular irrigation water.

### **C. Historical Background and Irrigation**

3. Historically, the rulers of the Southern kingdom built the first irrigation systems around Tissamaharama about 2000 years ago. Since then, irrigation systems have played a key role in Sri Lanka's economy. Systems development traditionally had emphasis on the participatory approach. The design of these systems was based on intermediary tanks (reservoir). Over time, these systems, including anicuts (diversion weirs) and tanks, were neglected, abandoned, restored, built, and rebuilt. With the decline of the kingdoms, the irrigation systems of the dry zone were neglected and the focus of the economy was on the wet zone. With the advent of the 20th century, a gradual effort was made to reactivate the dry zone for its proper economic exploitation. With independence in 1947, concerted efforts were made by the successive governments, responding to emerging economic and social needs, to develop dry zone lands in an integrated manner through irrigation and settlement schemes.

### **D. Location and the Project**

4. Kirindi Oya (river) is located in the dry zone area and is the only major source of surface water in its basin. It originates in the mountains in the central part of the southern half of the Island and discharges in the Indian Ocean east of Hambantota district. Its narrow, 80-km-long basin encompasses a total area of about 1,178 square kilometer (km<sup>2</sup>). The total catchment area of Kirindi Oya upstream of the dam site as envisaged under the Project is 913 km<sup>2</sup> with average rainfall varying between 2,700 mm in the mountains (upper end) and about 900 mm at the coast (lower end). The Kirindi Oya Irrigation and Settlement scheme was one of eight new and large irrigation schemes, and the largest in the south. It was launched in Sri Lanka to attain the Government's broad economic objectives and agricultural strategies.

5. The Kirindi Oya Irrigation and Settlement Project (KOISP) area, located in the southeast quadrant of the island, is about 260 km by coastal highway from the capital Colombo. KOISP covers a gross area of about 21,000 ha, including a reservoir area of about 3,600 ha. Both the dam and the reservoir are located east of Lunugamwehera village in Monaragala District, just bordering Hambantota District. The Project service area covers both left and right banks of the Kirindi Oya in Hambantota District. Out of about 18,900 ha, excluding the reservoir area, a total of 4,584 ha was being cultivated during *maha*, 2,062 ha during *yala*, and 1,900 ha under slash-and-burn shifting (*chena*) cultivation. A storage reservoir (tank) at Badagiriya served a command area of 850 ha and a diversion weir at Ellagala consisting of five balancing reservoirs for existing Kirindi Oya irrigation system commanded 3,734 ha.

6. The Project area was found to be well connected to all parts of the country by a network of metalled roads, whereas the existing road network within the Project area would need extensions and improvements to meet needs resulting from development. The principal town in the Project area (Tissamaharama) and the major villages had electricity. The Project area was serviced by research and training centers located at Angunakolapelessa, some 60 km from the Project area, as well as extension services of the Department of Agriculture (DOA). The major sources of institutional rural credit were the two state-owned banks, the Bank of Ceylon (BOC) and the People's Bank (PB). Both had operations in the Project area (with the same eligibility criteria and interest and repayment conditions). While the private sector had the dominant role in marketing, storage, and processing activities, public sector involvement had emphasis on ensuring stabilization of the produce markets by the operations of the Guaranteed Price Scheme (GPS) for paddy and the Floor Price Scheme (FPS) for the subsidiary food crops. The Project area (including the reservoir area) had an estimated population of 33,000, comprising 6,300 families in the existing irrigated area commanded by the Ellagala anicut, and 1,500 families in the Badagiriya Tank colony. Although agriculture was the main source of employment, a few families were engaged in business, electrical and service activities, besides being farm laborers and landless people.

## **E. Objectives of the Government**

7. The objectives of the Government are the attainment of self-sufficiency in food and better demographic distribution to alleviate the increasing pressure of population in the wet zone. The major focus of the agriculture sector policies of the Government of Sri Lanka (the Government) over the medium term and since the 1970s has been on acceleration of production, increased employment, enhanced income, and better nutritional status of the rural population. A principal element of the strategy in support of these objectives is to augment agriculture production in the country's dry zone through rehabilitation and expansion of existing irrigation facilities, and provision of new irrigation capacities and basic infrastructure facilities for a new settlement. The Accelerated Mahaweli Development Program is the forerunner of this strategy, supported by other water resource development and land settlement schemes. The KOISP, cofinanced by the Bank with the International Fund for Agricultural Development (IFAD) and Kreditanstalt für Wiederaufbau (KfW), is one of such major schemes.

## **F. The Economy and the Project's Relevance**

8. In spite of industrial and service activities upsurge, agriculture continues to play a dominant role in the economy of Sri Lanka, contributing one third of the gross domestic

product (GDP), two thirds of foreign exchange earnings, and half of the employment. Major exports are tea, rubber, coconut, and major plantation crops and their products. Notwithstanding such predominance, the performance of the agriculture sector (other than paddy) has generally been sluggish. Thus, the growth and output strategy heavily relied on increasing agriculture production in the dry zone.

9. Like other sections of the dry zone, the potential of the KOISP area for agriculture development was assessed to be promising but for lack of adequate irrigation facilities. The soil and rainfall conditions of the Project area were likewise found to be good. For full exploitation of the potential, the need for providing, besides irrigation, proper storage and drainage facilities was also identified.

#### **G. Project Design Basis**

10. A number of investigations in regard to the Project during the two decades preceding Bank appraisal in 1977 were undertaken by the Government. A Bank-financed technical assistance (TA) reviewed the earlier studies as a basis for formulating a suitable project for possible Bank financing. Based on such intensive investigations, the Project was conceived as an irrigation one with a strong settlement component and a dam. By design components and priorities, it was closer to an integrated area development project.

**COMPARATIVE SCOPE OF ORIGINAL KOISP  
AND REFORMULATED PHASE I AND PHASE II**

<b>Component</b>	<b>KOISP</b>	<b>Phase I</b>	<b>Phase II</b>
Irrigation Works	(i) Construction of dam and appurtenant structures (ii) Construction of 61.6 km of main canals and distribution system (iii) Land clearing and leveling for 8,400 ha of new land (iv) Rehabilitation of existing irrigation systems for 4,600 ha irrigation works	(i) Construction of dam and appurtenant structures (ii) Construction of 47.0 km of main canal and distribution system (iii) Land clearing and leveling for 4,200 ha of new land (iv) Rehabilitation of existing irrigation systems for 4,600 ha	---  (i) Construction of 9.6 km of main canal and distribution system (ii) Land clearing and leveling for 4,100 ha of new land (iii) Complementary works for existing and Phase I irrigation facilities
Land Settlement	(i) Construction of 28 hamlets, 4 village centers, and 1 township and 200 km of hamlet and village roads (ii) Buildings for the hamlets, villages, and township (iii) Settlement of 8,400 families (iv) 420 wells for domestic water supply	(i) Construction of 18 hamlets, 2 villages, and 1 township and 235 km of hamlet and village roads (ii) Buildings for the hamlets, villages, and township  (iii) Settlement of 4,200 families (iv) Construction of 210 wells (later deleted in favor of water supply system drawing from reservoir) (v) Assistance for temporary housing for settlers	(i) Construction of 17 hamlets and 2 villages and 139 km of feeder roads, and hamlets and village roads (ii) Buildings for Phase II hamlets and villages (iii) Additional buildings for Phase I (iv) Settlement of 4,500 families  ---  (v) Assistance to Phases I and II settlers for permanent housing
Social Forestry	---	---	(i) Propagation and distribution of planting materials for woodlot and home lot development and strengthening of forestry extension services
Livestock and Dairy Development	---	---	(i) Livestock service center and purchase of imported and local animals
Agricultural Development	(i) Construction of 1 District Training Center (ii) Development of pilot schemes for paddy double cropping and cotton cultivation (iii) Provision of 45 4-wheeled and 164 2-wheeled tractors	(i) Construction of an adaptive research station for on-farm water management of subsidiary field crops (SFCs) or other field crops (OFCs) (ii) Incremental staff, equipment, and quarters for research, extension, and training	(i) Construction of extension office, laboratory, and land development for agricultural extension and seed production (ii) Incremental staff, equipment, and quarters for extension, training, and seed production

Component	KOISP	Phase I	Phase II
Agricultural Credit			(i) Provision of 300 2-wheeled tractors (ii) Strengthening of branch banks
Consulting Services	(i) 88 person-months consulting services for design and construction supervision of the dam and appurtenant structures (ii) 24 person-months agronomy consulting services to assist in agricultural development	(i) 154 person-months consulting services for design and construction supervision of the dam and appurtenant structures (ii) 250 person-months local consulting services for design and construction supervision of irrigation system (not used) (iii) 36 person-months consulting services for project implementation (iv) 24 person-months consulting services for water management and 12 person-months for irrigation agronomy	(i) 6 person-months of foreign consulting services for construction management (ii) 222 person-months of local consulting services for Project programming and monitoring, marketing and financial and accounting services  —
Training	---	(i) 15 person-months overseas training in water management and agricultural research	(i) 30 person-months of overseas staff training
Operation and Maintenance Equipment	---	(i) Vehicles and equipment for operation and maintenance of irrigation facilities including electrical generators for emergency operation of spillway gates	(i) Vehicles and equipment for operation and maintenance of irrigation facilities
Environment	---	---	Buffer zone; study of critical areas of concern; relocation of elephants and establishment of national park
Project Benefit Monitoring and Evaluation	---	---	A series of studies



## **OBJECTIVES AND TARGETS OF THE PROJECT AS EVOLVED DURING FORMULATION, REFORMULATION, AND APPRAISAL IN 1977, 1982, AND 1986**

### **A. Objectives of the Project**

1. The broad sociopolitical and economic objectives of KOISP as outlined during formulation in 1977 and reformulation in 1982 comprised the following:

- (i) increased food and fiber production (to reach self-sufficiency especially in rice);
- (ii) generation of employment (construction, farm labor);
- (iii) foreign exchange savings to improve the balance of payments;
- (iv) settlement of landless people (to reduce the population pressure in the wet zone, to exploit the human resources of the peasantry, and to improve the position of the peasant cultivator, for more equitable land distribution); and
- (v) increased income for Project beneficiaries through irrigation and improved crop management.

2. The environmental aspects of the Project were also looked into during both 1977 and 1982. The 1982 reformulation document specifically attended to environmental and public health concerns related to the Project, e.g., minimizing negative environmental effects by emphasizing the proper use of agrochemicals in the field. The reformulation document thus identified measures to prevent further environmental degradation associated with *chena* cultivation and emphasized proper land use and application of appropriate farming systems.

### **B. Physical Targets**

3. Keeping the cited broad objectives in view, the quantified targets of the Project are detailed below.

#### **1. Targets Set during Appraisal in 1977**

- a. to construct a 5,000 meter (m) long and 25-m-high dam with a storage capacity of 197.8 million cubic meters (m<sup>3</sup>) with spillway and sluices;
- b. to construct 61.6 kilometers (km) of main canals;
- c. to provide irrigation facilities to 8,409 hectares (ha) of new land;
- d. to improve the irrigation facilities for 4,525 ha of the existing system (Ellagala: 3,734 ha and Badagiriya: 850 ha).
- e. to settle 8,320 farm families in 32 hamlets and villages with the necessary infrastructure (roads, public health, education, rural water supply [420 wells for new settlers], cooperative stores, community services);

## **2. Targets Revised Consequent to Phasing of Investment in 1982**

4. In addition to dam construction work, the broad irrigation and settlement target as revised are detailed below:

- a. To settle approximately 4,200 farm families with the necessary infrastructure;
- b. To provide 4,191 ha (right bank 2,550 ha, and left bank 1,641 ha) with new irrigation facilities (total 8,775 minus 4,584)<sup>a</sup>;
- c. Improved irrigation facilities for 4,584 ha.

## **3. Targets Set during Appraisal in 1986**

5. Broad targets for settlement and irrigation, as set during appraisal in 1986, aimed to achieve the original targets of KOISP and consisted of the following:

- a. to settle 4,200 farm families with the necessary infrastructure, and
- b. to provide 4,200 ha with new irrigation facilities.

## **C. Additions to Project Components**

6. During the 1986 appraisal of Phase II, a number of components were added. Consequently, the Project as appraised in 1986, consisted of nine components including forestry and the environment:

- (i) irrigation and drainage (extension of left bank canal, branch distribution and field canals, secondary and field drains, land clearing and land leveling);
- (ii) land settlement (rural roads and water supply, hamlets and village center facilities, assistance to settlers, vehicles and equipment);
- (iii) Department of Agriculture: agricultural support services (extension, education and training, seed production);
- (iv) marketing (produce stores, market information, specialist marketing officer);
- (v) credit (bank field staff, training, credit facilities);
- (vi) livestock (service center, procurement of bulls and heifers, extension service, milk producer societies, sales network);
- (vii) forestry (nursery support, tree crop establishment and agroforestry, seedlings for home lots);

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<sup>a</sup>

The figures for the old and the new area for 1977 and 1982 do not match.

- (viii) environment (buffer zone, study of critical areas of concern, relocation of elephants and formation of National Park); and
- (ix) project benefit monitoring and evaluation (series of studies).

#### **D. Targets for Agricultural Component**

7. In addition, it is also important to note the dimension of agricultural objectives that underwent changes during the three phases of the Project, i.e., formulation, reformulation, and appraisal of Phase II. These are detailed below.

##### **1. As in 1977**

- a. double cropping of rice in the lowlands;
- b. nonrice crops on the uplands (cotton, pulses) in the dry season (*yala*) and subsidiary field crops (pulses, cereals) in the wet season (*maha*);
- c. a cropping intensity of 189 percent ("considered attainable");
- d. 4.0 tons (t)/ha per season as the average estimated yield of paddy.

##### **2. As under Phase I (1982)**

- a. double cropping of rice in the lowlands;
- b. one rice crop in the wet season on the upland and intermediate soils followed by subsidiary crops (pulses, oil seeds, cereals, and vegetables) in the dry season;
- c. a cropping intensity of 200 percent;
- d. 3.5 t/ha for upland paddy, 4.5 t/ha for lowland paddy in *maha*, and 4.8 t/ha for lowland paddy in *yala*.

##### **2. As under Phase II (1986)**

- a. lowlands: one rice crop during the wet season and 50 percent paddy and 50 percent subsidiary crops during the dry season;
- b. intermediate lands: paddy during the wet season and subsidiary crops during the dry season;
- c. uplands: 80 percent rice and 20 percent subsidiary crops during the wet season and 100 percent subsidiary crops during the dry season;
- d. a cropping intensity of 170 percent.

## BRIEF DESCRIPTION OF REFORMULATION BACKGROUND AND EXERCISE

1. The Kirindi Oya Irrigation System<sup>a</sup> supported by the Project has been designed to incorporate six existing tanks and a new irrigated settlement area. The system includes four subsystems:

- a. The Ellagala System, tapping Kirindi Oya with five tanks which have been in existence for many years (the "old" system), supplemented from the new left-bank main canal.
- b. The right-bank main canal system, with three new irrigation tracts in Phase I and four in Phase II.
- c. The left-bank main canal system with two irrigation tracts in each phase.
- d. The Badagiriya System on the Malala Oya, also a pre-existing system, with supplementary water to be provided from the right-bank canal.<sup>b</sup>

2. One specific reason for the delay in planning, designing, and implementing Kirindi Oya Irrigation and Settlement Project (KOISP) was the size of its investment cost. The commitment of funds by the Bank reinforced the Government efforts to solicit cofinancing. The Government initially arranged cofinancing from International Funds for Agricultural Development (IFAD) in 1978. Finalization of cofinancing took a much longer time than originally envisaged and, in conjunction with other implementation delay factors, caused further cost increases. The Government subsequently also arranged cofinancing from Kreditanstalt für Wiederaufbau (KfW) in 1979. However, the time taken to mobilize resources and the sluggishness of implementation caused costs to go up. This resulted in a constant gap in resources. Some of such delay factors were obviously beyond the control of the Executing Agencies involved. Nevertheless, their combined effect caused a substantial cost overrun by December 1980. The Government requested the Bank and other cofinanciers to provide supplementary financing to meet the cost overruns. The Bank and cofinanciers proposed the phasing of the Project and the Government agreed. The Bank approved a technical assistance (TA) in July 1981 to assess the technical feasibility and economic viability of phasing the Project. The phasing of Project investment was the result of all these.

3. During the reformulation exercise, the scope of the dam and that of the appurtenant structures under Phase I remained the same as under KOISP. However, certain design improvements related to the dam were made. The principal changes involved in phasing the Project were (i) reduction in the area of new irrigation from 8,400 hectares (ha) to 4,200 ha, with a corresponding reduction in secondary and other canals, and (ii) reduction in the number of farm families for settlement from 8,320 to 4,200. In other words, Phase I had the objectives, among others, of improving irrigation facilities for the existing 4,584 ha (Ellegala system 3,734

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<sup>a</sup> The word "system", among others, means "canals and structures."

<sup>b</sup> This was supposed to be included under Phase II, but the Central Coordinating Committee later decided to exclude it because of shortage of water.

ha and Badagiriya Tank system 850 ha) and providing additional irrigation facilities for 4,191 ha (totaling 8,775 ha) <sup>a</sup> to ensure irrigation water for paddy cultivation.

4. Phase II of the Project was a logical sequel to Phase I, permitting fuller and better use of water resources already developed under it. Phase II thus targeted the development of the remaining systems and coverage of areas as per original plan. It also incorporated measures to address deficiencies identified in Phase I. Broadly speaking, and among others, Phase II included irrigation development of 4,200 ha, additional feeder roads, drinking water supply, development of hamlets, and village centers for settlement of 4,500 families, etc. The deficiencies addressed related to modest interventions through additional project components as agricultural credit, marketing, social forestry, livestock, dairy development, relocation of wildlife, and provision of tractors (300 units) and implements, consulting services, staff training, and Project benefit monitoring and evaluation. The design of Phase II also enabled timely response to the new emphasis of the Government for crop diversification.

5. In addition, Phase II also provided for complementary civil works pertaining to irrigation and settlement components under Phase I. These included, among others, raising the canal embankments, lining, lot improvement, roads, etc. The following adjustments were made subsequent to the water shortage:

#### **Irrigation Development**

- Raising main canal embankments
- Lining selected sections of LB and RB main canals
- Construction of 2 spillways for LB and RB main canals
- Remodelling of Ellagala Anicut
- Remodelling of discharge measurement structures
- Drainage outlet canal to Malala Lagoon
- Repairs to spillway Gates, hoists and outlet to Ellagala Anicut
- Rectification of irrigation and drainage facilities in Phase I area
- Rectification of irrigation deficiencies in Ellagala Irrigation System
- Reconstruction and refurbishing of Chief Resident Engineer's (CRE) Office
- Construction of 3 access roads in RB Tracts 2,5, and 7.
- Improvements to Ellagala System
- Lot improvements
- Field canal roads

#### **Construction of Hydrometric Stations**

3 hydrometric stations were envisaged to be constructed at Kitulkote, Kuda Oya, and Nugayaya to gauge inflows to the reservoir.

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<sup>a</sup> This was to cover 63 per cent of the original Project area during two seasons a year, benefiting 4,500 families.

**Construction of O & M Houses**

15 houses planned for O & M staff of the Irrigation Department was reduced to 11 when the scope of the project was modified.

**Precision Land Leveling**

40 demonstration lots were included in the project proposals for precise land leveling by Land Use Division (LUD) of DOI but were reduced to 6.

6. The scope and major activities of Phase II, as appraised and detailed here, had to be revised during implementation because of the unanticipated water constraints and other reasons. For example, the reduction of the length of the LB Main Canal reduced the quantum of work related to branch canal, distributary and field canals, and secondary and field drains. The deletion of RB Tracts 3 and 4 had similar affects on associated structures. All village tanks under RB Tracts 6 and 7 were left without obliteration to ensure domestic use and cattle raising.

### IRRIGATION DEVELOPMENT - TARGETS AND ACHIEVEMENTS (Phase II)

Item	Unit	Target Appraised	Target Revised	Achievements against revised target (%)	Remarks
1. Civil Works in Phase II					
Original Works					
(i) Main and branch canal					
a. Left Bank (LB) main/branch Canal	km	11.8	4.4	100	Reduced due to shortage of water
b. Right Bank (RB) branch canal	km	10.5	deleted	-	- do -
(ii) Tract development					
a. LB Tract 3	ha	1308	320	100	- do -
Drainage canals	km	12.7	6	100	- do -
Field canals	km	79	32	100	- do -
Subsidiary drains	km	24.5	7	100	- do -
Field drains	km	27.8	10	100	- do -
Boarder bunds	lot		100	50	Poor response of farmer organizations
b. LB tract 4	ha	380	deleted		Due to shortage of water
c. RB tract 3 and 4	ha	1500	deleted		- do -
d. RB tract 6 and 7	ha	910	910	100	
Drainage canals	km	13	15	100	
Field canals	km	57.8	50	100	
Subsidiary drains	km	16.3	17	100	
Field drains	km	28.6	22	100	
Boarder bunds					
(iii) Access road	no.	3	3	100	
Additional Works					
(i) Field canal roads Phase II					
RB	no.	39	39	100	
LB	no.	33	33	100	
(ii) Construction of drainage outlet canals from Malala Lagoon	item	-	-	100	
(iii) Development of other field crops (OFC) area (outlet structure from LB main canal (LBMC))	no.	1	1	100	

	Item	Unit	Target Appraised	Target Revised	Achievements against revised target (%)	Remarks
(iv)	Improvements to 4 tanks in RB area	no.	4	4	100	
(v)	Lot improvements (LB)	no.			100	Due to water issues
	Lot improvements (RB)	no.			90	
2.	Complementary Civil Works for Phase I					
	Original Works					
(i)	Lining of main canals					
	RB main canal	Chs		12	100	Due to water issues
	LBMC	Chs		19.8	100	
(ii)	Remodelling of discharge measurements structure	no.	40	40	100	
(iii)	Remodelling of Ellagala Anicut	no.	1	1	100	
	Additional Works					
(i)	Reconstruction of Chief Resident Engineer's (CRE's) office	no.	1	1	100	Burned by subversives
(ii)	Minor corrections irrigation system				90	Water issues and lack of machineries
(iii)	Lot improvements Phase II				100	
(iv)	Rectification of irrigation difficulties					
	Feeder canal systems				50	Completed except for the Ellagala feeder canal
	Canal system under five tanks				90	
(v)	Raising of main canal embankments					
	LBMC	item			100	
	RBMC	item			100	
(vi)	Collector drains along RBMC			deleted		Not necessary
(vii)	FC roads (Ph. I)					
	RB	no.		157	100	
	LB	no.		103	100	
3.	Repainting of Spillway Gates of Lunugamwehera Tank	item			100	
4.	Hydrometric Stations	no.	3	3	100	
	Meteorological Stations	no.	3	3	100	



Item	Unit	Target Appraised	Target Revised	Achievements against revised target (%)	Remarks
5. Operation and Maintenance (O&M) Houses	no.	13	11	100	
6. Precision Land Leveling	ha	40	40	100	
7. Feeder Roads					
Weerawila junction to new town	km		2	100	
Beralihela to Kataragama road	km		12	100	
Lunugamwehera to LB Hamlet 1 & 2	km		16.1	100	
Lunugamwehera to RB Hamlet 18	km		16.8	100	
RB Hamlet 18 to Welligatta	km		7	100	
8. Domestic Water Supply Sch. Phase II					
C8-Treatment Plant				100	
C9-Water Towers				100	
C10-Distribution System				100	
C11-Electricity and Mechanical Installations				100	

## WATER ALLOCATION AND RELEASE PROCEDURES

1. As in most other irrigation projects schemes in Sri Lanka, the issue of water under the Kirindi Oya Irrigation and Settlement Project (KOISP) largely depends on its level in the reservoir. If the water level is at 33 percent or more of the total capacity of the reservoir, then only a decision to commence the cultivation season can be made. The Project Coordination Committee of the KOISP, comprising Project Officers and relevant district level officers, meet on a monthly basis under the chairmanship of the Government Agent (GA) Hambantota. This committee assesses the Project performance during the preceding month, examines the plan for the coming season, and reviews the water level situation in the reservoir. Before the advent of the cultivation season, a *pre-kanna* (preseasonal meeting) is called. Such meeting is participated in by FOs and officials of the relevant departments as well as the Chief Resident Engineer (CRE) and Senior Irrigation Engineer (SIE) (Water Management) of the Department of Irrigation (DOI). The *pre-kanna* meeting decides on the area to be cultivated and the date of first issue of water. This meeting is followed by a *kanna* meeting chaired by GA and participated in by the parties who attended the *pre-kanna* meeting. The *kanna* meeting takes a formal decision on the total extent of irrigation and the dates of water issue to each plot of land for the entire season. This is done with the endorsement of the representatives of FOs attending the meeting. The SIE prepares the schedule of water issues based on the meeting's decision. Relevant Government departments draw up their planned actions as per the requirements of the agreed upon schedule. Normally, the *pre-kanna* meeting is held in mid October, about one month before the water issue. The *kanna* meeting comes after about one week. The *pre-kanna* meeting is held for each tract. Farmers in each tract participate in the preparatory meeting. The *pre-kanna* meeting is also attended by field-level officers of line agencies including commercial banks and the agricultural insurance board. The farmers are invited through colonization officers of Land Commissioner's Department (LCD) and elected field channel leaders.
  
2. In KOISP, the *pre-kanna* meeting is chaired by the Project Manager (Settlement or his Deputy). The objective of the meeting is to explain the proposed agriculture program for the season to the farmers and get their approval. The *kanna* meeting is held under the provisions of the Irrigation Act and is chaired by the Government Agent or his authorized officials. The decision taken at *pre-kanna* meeting are usually confirmed at the *kanna* meeting.
  
3. DOI is responsible for the operation of sluice gates, gated regulators, turnout gates along the main canals, branch canals, and distributary canal up to the field channel turnouts. The CRE is the highest project level officer of DOI. He is supported by the SIE (Water Management) and three resident engineers in charge of RB, LB, and headworks. The field-level operation is done by "Irrigators" (*Jalapalaka kamkaru*) under the instructions of technical assistants (TAs) and supervision of work supervisors. The water requirements are estimated before commencing water issue for the season, based on estimates of TAs as to direct issues from main or branch canals as well as design assumptions, taking note of the cropping patterns. The water issues down to the field channels turnouts are supposed to be given according to this water requirement schedule. Releases from the reservoir is supervised by the Resident Engineer in charge of the respective main canal. In the case of the rotational issue, the release depends on the timetables prepared by the TAs for their respective area of responsibilities. The TAs have the responsibility to operate the gated regulators on the main canal and branch canals as well as distributary- and field-channel turnout operation. Water distribution in turnout areas is to be handled by farmers organized into turnout groups. Field channel leaders are responsible for operating the turnout gates.

**SETTLEMENT OF FARMERS<sup>a</sup>**  
**LISTING OF BASIC AND ASSOCIATED INFRASTRUCTURE, SUPPORTIVE ASSISTANCE,**  
**AND PROVISION OF EQUIPMENT AND VEHICLES**

- (i) Construction of basic infrastructure (hamlets, village centers, internal roads, and development of agricultural lands) work comprising:

	KOISP	Phase I	Phase II
(a) Construction of hamlets	28	16	17
(b) Construction of village centers	5	3	2
(c) Construction of internal roads	140 km	150 km	125 km
(d) Construction of interconnecting roads	60 km	85 km	-
(e) Construction of wells for drinking water	420	210	-

- (ii) Construction of associated infrastructure (in each hamlet, village center including Lunugamwehera)

**For each hamlet**

(a) Construction of branch cooperative store	1	1	1
(b) Construction of primary school	1	1	1
(c) Construction of school staff quarters	-	as required	1
(d) Construction of community center (health clinic)	1	1	1
(e) Living quarters for LCD field inspector	-	-	-

(for alternate hamlet)

(f) Construction of World Food Programme (WFP) store with staff quarters	-	1	1
--	---	---	---

**For each village center**

(a) Construction of health facility center	1	1	1 (with staff quarters)
(b) Construction of branch cooperative	1	1	1
(c) Construction of secondary school	1	1	1 (with staff quarters)
(d) Construction of sub post office with staff quarters	1	1	1
(e) Agrarian services center with store and staff quarters	-	-	1 (Wirawila)
(f) Provision of electricity supply	-	-	Beraliyahela

	KOISP	Phase I	Phase II
<b>At Lunugamwehera</b>			
(a) Construction of rural hospital with staff quarters	-	1	1
(b) Construction of police station with staff quarters	-	1	-
(c) Project Office (settlement)	-	-	1

<sup>a</sup> The Land Commissioner's Department was the he Executing Agency for this component.

- (iii) Supportive assistance to settlers (food aid, essential inputs and financial support for housing and land development):
- (a) The settler families came into occupation of the allotments 12-18 months prior to the issue of irrigation water for cultivation. During this period they received two types of assistance: Government subsidies, and food stuffs under the WFP. The WFP food aid consisted of daily rations of flour, sugar, pulses, and dried fish for about 15 months.
  - (b) As regard Government subsidies, Phase I included materials for temporary housing, payment for stumping and ridging at farm lots, seeds for cultivation, and agricultural implements. Phase II included provision of 2,000 packages of materials for permanent houses, 1,140 packages of agricultural tools and inputs, and 450 km of fencing materials.
- (iv) Other support activities:
- (a) Procurement of vehicles and equipment essential for carrying out the settlement activities.
  - (b) Administration expenditure to achieve the settlement objectives.
- (v) Settlement activities were much less during Phase II compared with what is envisaged. The water shortage factor was principally responsible. A comparative statement of settler program as appraised under Phases I and II and as actually achieved is in Table 1.

**Table 1: Comparative Statement of Settler Program as Appraised under Phase II and as Actually Achieved During Implementation**

Item		Unit	Appraised	Revised
Package of Permanent Housing (Phases I and II)		no.	8,700	2,000
Agricultural Tools and Inputs		no.	4,500	1,140
Fencing Materials		km	--	450
Forestry Materials (Forestry Inputs for Woodlots)		no.	540	900
Enlarged Home Lots		no.	1,000	253
Consulting Services		person-months	72	79
Staff Training		person-months	3	3
Hamlets and Village Centers				
(i)	RB Tracts 6 and 7	no.	3	3
(ii)	RB Tracts 3 and 4	no.	6 and 1	deleted and 1
(iii)	LB Tract 3	no.	6 and 1	2 and deleted
(iv)	LB Tract 4	no.	2	deleted

**CREDIT COMPONENT: STATUS OF PROCUREMENT OF TRACTORS, EQUIPMENT, AND  
UNDERTAKING OF FOREIGN AND LOCAL TRAINING**

Executing Agency : Central Bank of Sri Lanka  
Cooperating Agencies : Participating Banks - Bank of Ceylon, People's Bank, RRDB Hambantota  
Progress : As of 31 December 1993

Component/Item	Units	P *		1987	1988	1989	1990	1991	1992	1993	Total
		A *									
<u>Agriculture Credit</u>											
1. Import of Two-wheeled Tractors	no.	P		21	4	75	100	100	-	-	300
		A		21	4	8	67	62	40	0.04	206
2. Support for Credit Services											
a. Procurement of Vehicles and Equipment											
Pickup Truck	no.	P		-	-	4	-	-	-	-	4
		A		-	-	-	-	2	-	-	2
Motorcycle	no.	P		-	-	18	8	-	-	-	26
		A		-	-	-	-	7	4	-	11
Office Equipment	lot	P		-	-	14	6	-	-	-	20
		A		-	-	-	18	-	2	-	20
b. Training											
Local	person-month	P		-	18	-	8	-	-	-	26
		A		-	18	-	-	-	8	-	26
Overseas	person-month	P		-	-	-	8	-	-	-	8
		A		-	-	-	-	-	-	8	8

\* P - Planned A - Achieved

## KOISP: COORDINATION, IMPLEMENTATION, AND EXECUTION ARRANGEMENTS OF THE PROJECT AND OPERATION OF THE PROJECT FACILITIES

KOISP	Phase I	Phase II
<b>A. Coordination Arrangement</b>		
1. Central Coordination Committee (CCC), with Secretary of Ministry of Irrigation, Power and Highways (MIPH) as Chairman, responsible for execution, coordination, review and reporting to the Bank. To hold meetings at least once every quarter.	Secretary of Ministry of Land and Land Development (MLDD) to serve as Chairman of CCC	Same except membership enlarged to include: (i) Director, Department of Irrigation (DOI); (ii) Land Commissioner; (iii) Director, Department of Agriculture (DOA); (iv) Director, Rural Credit Development (RCD) of the Central Bank.
2. Project Coordination Committee (PCC), chaired by Project Manager (PM), to report project progress to CCC. To hold meetings once a month.		PCC, to be chaired by Government Agent for Hambantota District, with PM (Settlement) as Secretary.
<b>B. Implementation Arrangement</b>		
1. The responsibility for execution of the Project should not be entrusted to a single department or a Board. DOI is to act as the principal executing agency particularly responsible for irrigation under MIPH. Land Commissioner's Department (LCD) to be responsible for infrastructure and settlement component. DOA to be responsible for agricultural development.	As in KOISP.	Four executing agencies for the Project, viz., DOI, LCD, DOA, and CBSL. DOI to be the principal executing agency. LCD to receive technical and extension support for livestock and forestry developments from Draft Animal and Dairy Development Program (DADDP) and Forestry Department (FD). Other agencies also to assist.
2. Project Office (PO) and Project Manager (PM): PO to be located at Tissamaharama, headed by PM and adequately staffed (technical and administrative).	Two POs, one for irrigation and one for settlement established in Tissamaharama and in the Office of Additional Government Agent.	Same
3. DOA and DOI to assign Project OIC for respective components.	Chief Resident Engineer, DOI, is PM for irrigation and Additional Government Agent (AGA) is PM for settlement.	
4. PO to operate not less than four years from the completion of the entire Project.	Senior Deputy Director (Major Construction), DOI to be the Project Director to supervise PM (Irrigation) and to liaise with PM (Settlement).	
5. PO to take over irrigation facilities from TCEO and upon dissolution of PO, TCEO to resume authority for management.		
<b>C. Execution Arrangements</b>		
1. Part A - DOI, with the assistance of engineering consultant, to undertake planning, design and construction work related to rehabilitation of existing irrigation system, preparing land for new irrigation, construction of access roads, new canals, distributaries, farm ditches and drainage works (force account).	Same.	

	KOISP	Phase I	Phase II
2.	The dam, gated spillway, sluices, and related structures by local contractor under local competitive bidding (LCB).	The contract for spillway, sluice gates and hoists awarded to State Engineering Corporation through international competitive bidding (ICB). Contract for regulation gate to be awarded through LCB.	
3.	Part B - LDD to undertake through force account the provision of infrastructure and facilities.	LCD's Construction Division to do it through force account as the LDD was abolished.	
4.	Part C - DOA, with the assistance of agronomy consultants, to undertake agricultural development.		
5.	<p>Farm Mechanization</p> <p>Provision of 45 four-wheel tractors and 164 power tillers.</p> <p>Tractors to be procured by DOA through the Sri Lanka State Trading (Tractors) Corporation (SLSTC).</p> <p>Power tillers to be sold to farmer buyers of the Project area as approved and at a price so specified by the "Tractor Committee (TC)" comprising the District Agriculture Extension Office, Asst. Govt Agent, and the District Representative of the Department of Rural Institutions.</p> <p>Four-wheel tractor to be sold to Agricultural Productivity Committees and to persons approved by TC for use in the Project area.</p> <p>Credit facilities for tractor and farm equipment purchase to be provided by People's Bank (PB) and Bank of Ceylon (BC).</p>	<p>No additional tractor was provided as it was concluded, based on ARTI and the University of Reading's studies, that the combined tillage potential of draft animal and tractor power (enhanced considerably due to liberalization of the economy and increase in aid programs) is adequate to meet the demand.</p>	<p>Provision for 300 additional two-wheeled tractors was made. End users preference procedure was adopted.</p> <p>The portion of the loan proceeds to be used for financing tractors to be made available to farmers through CBSL-designated participating financing institutions.</p>
6.	<p>Settlement</p> <p>One ha of irrigable farmland and 0.2 ha of homestead land to be given to each farm family free of cost.</p> <p>Selection of settlers by LCD to follow criteria of (a) evacuees from reservoir site, (b) families cultivating or living in the Project area, (c) interested applicants from outside.</p> <p>Land clearance to be done significantly ahead of time to ensure evacuees settlement.</p> <p>Necessary goods or services to the settlers to be subsidized.</p>		<p>Social forestry component with two models - woodlot development and home lot development - introduced. Settlers selected on the basis of willingness to be provided with 0.75 ha of lots. Such lots to be located near hamlets.</p> <p>The home lot model was interrelated with livestock and dairy development component. Upland home lots of settlers participating in the component to be increased from 0.2 ha to 0.6 ha. However, their irrigation farmland size to be reduced to 0.8 ha.</p>

KOISP	Phase I	Phase II
<p>Settlement to begin from the end of 1982. Seven hamlets to be constructed annually to settle 2,000 families. DOI, LDD, and LCD to work closely.</p> <p>Settlement facilities, i.e. street, clinics, to function concurrently.</p>		
7. Watershed Management		
<p>By end 1978, DOI to survey water catchment areas of the reservoir, prepare a watershed management program to enhance water catchment and minimize soil erosion and silting of the reservoir (submit to Bank for comments).</p>		
8. Water Management		
<p>DOI to prepare water management plan for the Project area and submit the same to the Bank by June 1982 for review and comments.</p> <p>Such plan is to be implemented prior to completion of headworks.</p>	<p>DOI to prepare by June 1984 water management plan for the Project area based on a 24-hour/day supply system on a rotational basis, covering upland and lowland soils and water issue schedule for subsidiary crops.</p>	
9. Malaria Eradication		
<p>Anti-malaria organization of Government to take urgent preventive and remedial measures to eradicate malaria.</p>		
10. Supply of Agricultural Inputs, Credit and Estimate		
<p>Government to ensure adequate credit through BC and PB.</p> <p>Fertilizers, pesticides, and improved seeds to be provided on a timely basis.</p> <p>One Krushikarma Viyapala Sevaka (village-level worker) to be assigned by DOA to each 500 farm families and one agricultural Instructor to supervise five village-level workers.</p>	<p>Agrarian Service Department (ASD) of MADR to ensure availability of supplies of farm input.</p>	
11. Paddy Marketing		
<p>Paddy Marketing Board (PMB) to purchase, store, mill, and transport paddy in the Project area.</p>	<p>Government to continue its price support policy (both paddy and other field crops (OFC)) to ensure effectiveness of the floor price support scheme.</p>	



KOISP		Phase I	Phase II
12.	Cotton Marketing		
	Government to ensure that cotton products of the Project are purchased by the National Textile Corporation (NTC).	Planting of cotton during dry season omitted.	
13.	Data for Benefit Monitoring and Evaluation		
	ARTI to monitor and compile data, including baseline to facilitate benchmark assessment and postevaluation.	ARTI to conduct a benchmark and medium-term and post-project surveys for evaluation reports to be used by the Government and the Bank.	
14.	Land Acquisition		
	All land needed to be made available or acquired by the Borrower.		
15.	Irrigation Service Fees		
	Prepare and submit to the Bank by 1 January 1979 a cost recovery program to recover total operation and maintenance (O&M) costs and part of capital cost of the Project.	The Government to prepare and submit to the Bank a cost recovery program with gradual and progressive increase in irrigation service fee (ISF) commencing 1986 (50% of O&M by 1990) and total thereafter. In addition, ISF to reintroduce Irrigation Firms Fund (IFF) established and maintained by local Govt Agent.	
16.	Operation and Maintenance	Detailed proposals for O&M of Project facilities to be implemented by 1 October 1985 with necessary budget allocations for DOI and other concerned agencies/ departments who will have the responsibility for O&M for facilities under parts B and C.	
17.	Training and Extension Staff	Extension staff assigned to the Project to undergo adequate training prior to such assignment.	
18.	-	-	Environment

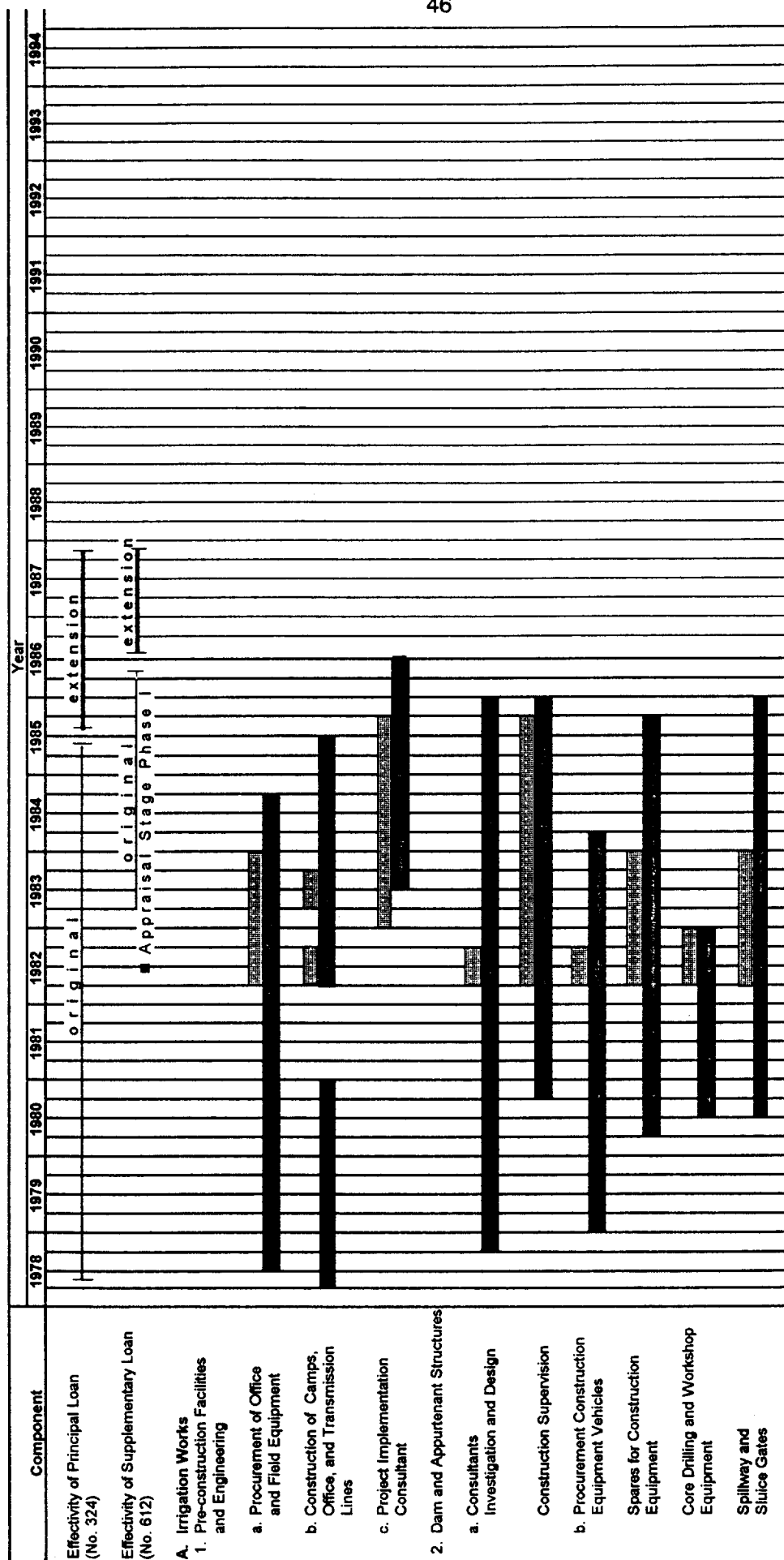
**KOISP : FINANCING PLAN IN TERMS OF PHASES**  
**(\$ million)**

Source	Foreign Currency	Local Currency	Total	Percentage
<b>A. Financing Plan for the Project <sup>a</sup></b>				
The Bank	20.0	—	20.0	29.9
IFAD	4.0	8.0	12.0	18.0
KfW	—	13.3	13.3	19.9
The Government	—	21.5	21.5	32.2
Total	<u>24.0</u>	<u>42.8</u>	<u>66.8</u>	<u>100.0</u>
Percent	35.9	64.1	100.0	
<b>B. Supplementary Financing Plan</b>				
The Bank	10.0	—	10.0	35.7
IFAD	2.0	4.0	6.0	21.4
KfW	—	7.6	7.6	27.1
The Government	—	4.4	4.4	15.7
Total	<u>12.0</u>	<u>16.0</u>	<u>28.0</u>	<u>100.0</u>
Percent	42.9	57.1	100.0	
<b>C. Overall Financing Plan for Phase I <sup>b</sup></b>				
The Bank	30.0	—	30.0	37.6
IFAD	6.0	12.0	18.0	22.6
KfW	1.8	19.1	20.9	26.2
The Government	—	10.9	10.9	13.7
Total	<u>37.8</u>	<u>42.0</u>	<u>79.8</u>	<u>100.0</u>
Percent	47.4	52.6	100.0	
<b>D. Financing Plan for Phase II</b>				
The Bank	10.2	16.4	26.6	80.4
The Government	—	6.5	6.5	19.6
Total	<u>10.2</u>	<u>22.9</u>	<u>33.1</u>	<u>100.0</u>
Percent	30.8	69.2	100.0	
<b>E. Total Financing Plan</b>				
The Bank	40.2	16.4	56.6	50.1
IFAD	6.0	12.0	18	15.9
KfW	1.8	19.1	20.9	18.5
The Government	—	17.4	17.4	15.4
Total	<u>48.0</u>	<u>64.9</u>	<u>112.9</u>	<u>100.0</u>
Percent	42.5	57.5	100.0	

<sup>a</sup> Subsequent to cofinancing.

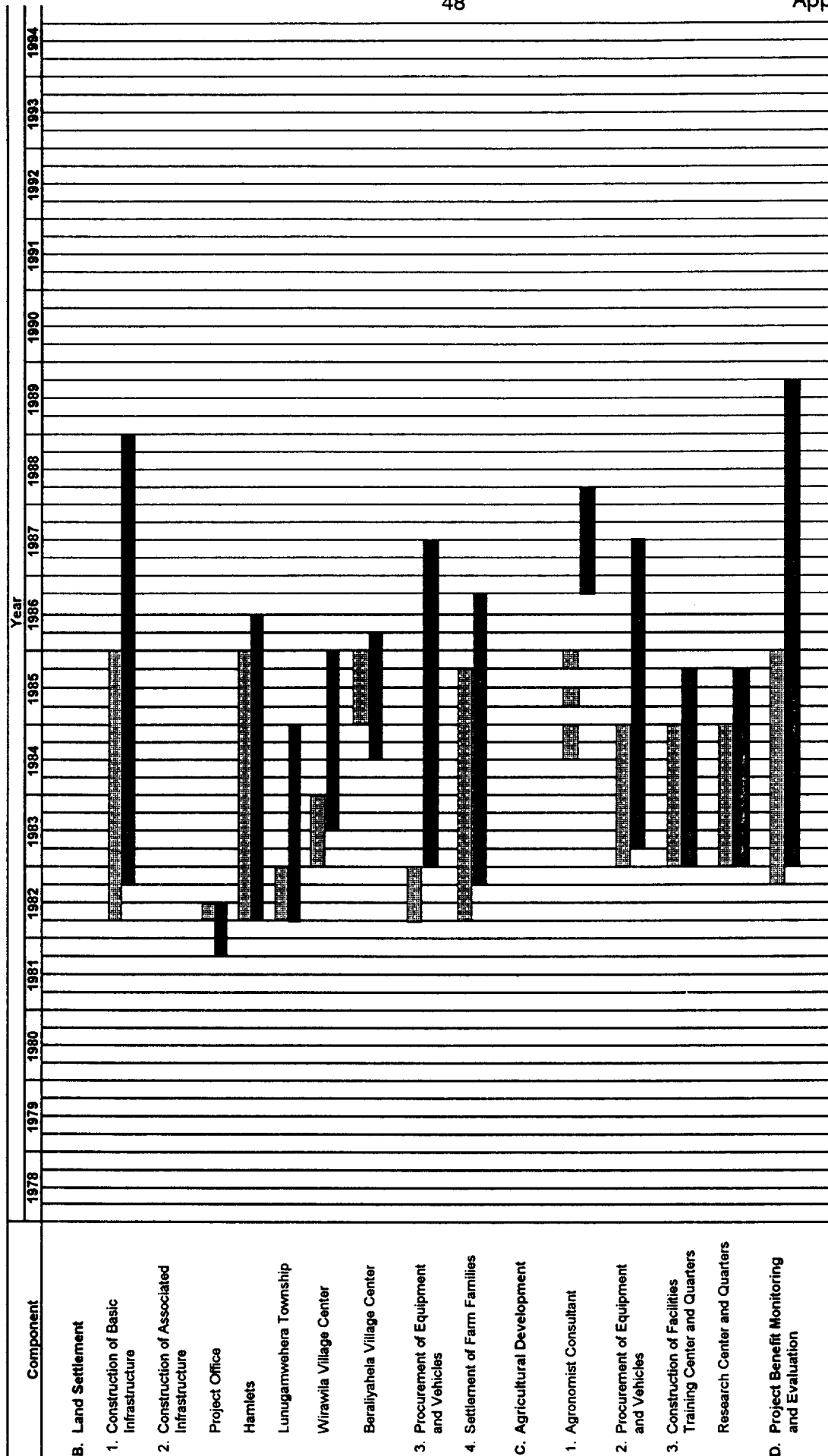
<sup>b</sup> As reappraised in November 1982.

**IMPLEMENTATION STATUS - PHASE I**  
**Kirindi Oya Irrigation and Settlement Project**

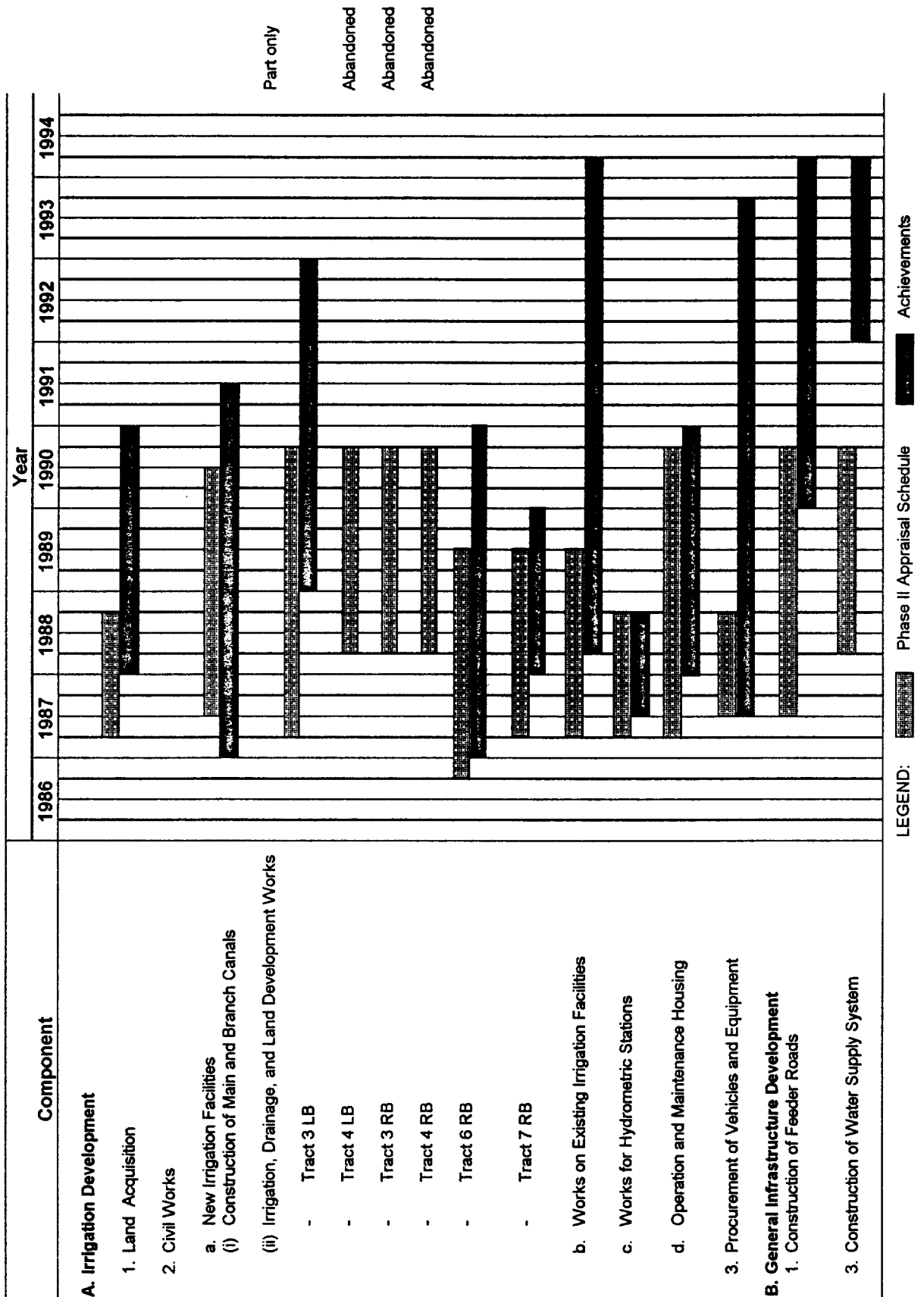


LEGEND:  Phase I Appraisal Schedule  Achievements

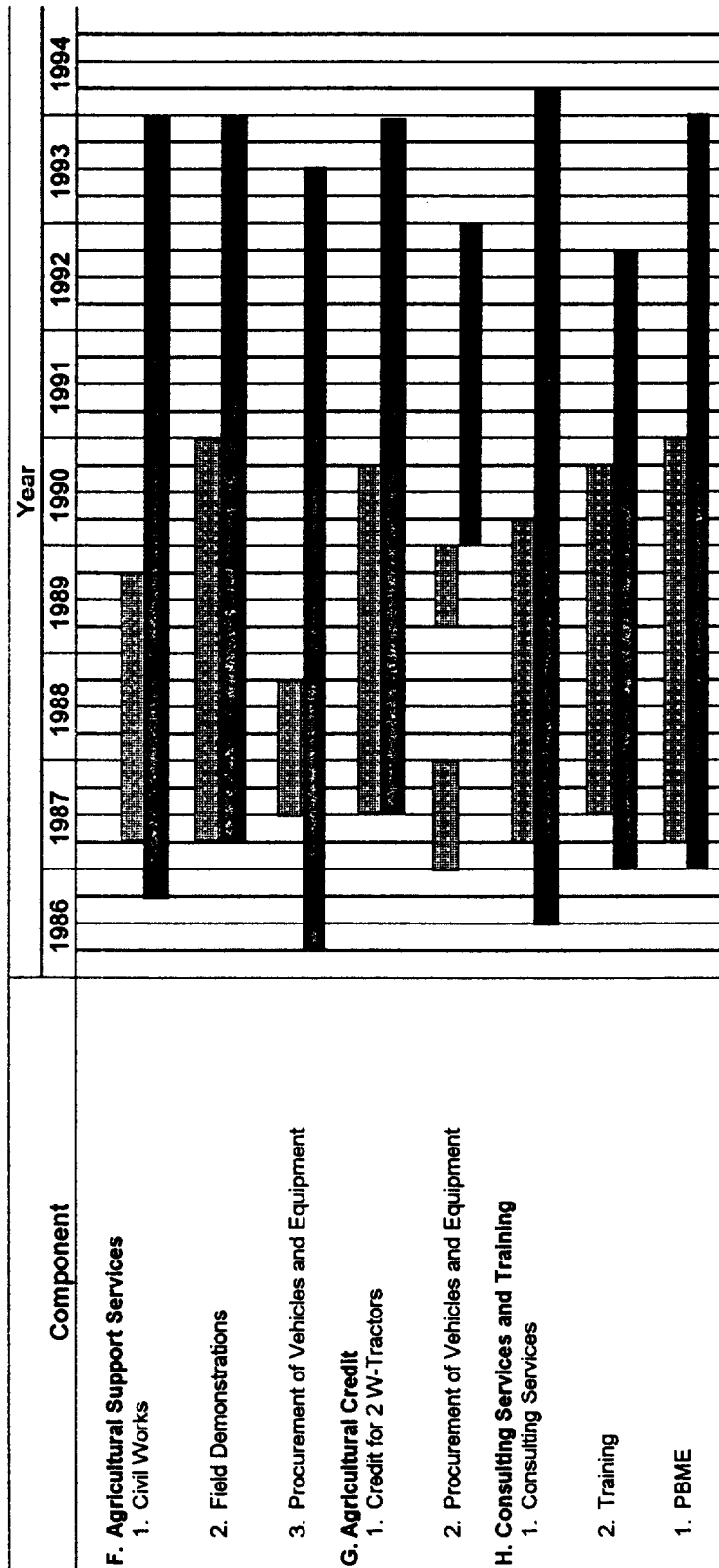
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**IMPLEMENTATION STATUS - PHASE II**  
**Kirindi Oya Irrigation and Settlement Project**



Part only  
Abandoned  
Abandoned  
Abandoned





## CONSULTING SERVICES RENDERED UNDER THE PROJECT AND THEIR UTILIZATION STATUS

Consultants Name/Type	Position	Person—Months Allocation (In Person—Months)			Variation	Actual Utilization
		KOISP	Phase I	Phase II		
<b>A. Internationally Recruited</b>						
(i) Water and Power Consultancy Services of India (WAPCOS)	— senior design engineer	8	—	—	1.5	9.50
	— geologist	4	—	—	—	4.00
	— hydrologist	1	—	—	—	1.00
—for design and construction supervision of dam and irrigation works.	— soil engineer	3	6.50	—	—	9.50
	— senior construction engineer	36	24.00	—	—	60.00
	— senior equipment engineer	36	24.00	—	12.0	72.00
	— design engineer	—	6.00	—	9.0	15.00
	— construction engineer	—	24.00	—	14.0	38.00
	— advisor	—	—	—	0.5	0.50
	— design specialist	—	—	—	0.5	0.50
	— gates expert	—	—	—	14.67	14.67
	<b>Total</b>	<b>88</b>	<b>84.50</b>	<b>—</b>	<b>52.17</b>	<b>224.67</b>
	agronomist — food crops	12	—	—	(12.0)	0.00
	agronomist — cotton	12	—	—	(12.0)	0.00
	<b>Total</b>	<b>24</b>	<b>—</b>	<b>—</b>	<b>(24.00)</b>	<b>0.00</b>
(ii) Agrar—Und Hydro—technik GmbH (AHT) and Selzgitter Consultant GmbH (SCG)	— project implementation	—	34.00	—	6.0	40.00
—for project implementation supervision of dam and irrigation works.	— construction engineer	—	—	—	9.0	9.00
	— geologist	—	—	—	5.13	5.13
	— water management planning	—	—	—	2.4	2.40
	— irrigation agronomist	—	12.00	—	10.0	22.00
	— design review	—	—	—	13.0	13.00
	— technical panel	—	—	—	2.0	2.00
	— water management (operations)	—	16.00	—	2.0	18.00
	— water management (system simulation)	—	8.00	—	—	8.00
	— irrigation network (systems operation and maintenance)	—	—	—	18.5	18.50
	— systems simulation expert	—	—	—	2.75	2.75
	— home office support	—	6.00	—	—	6.00
	— unallocated experts	—	5.00	—	4.5	9.50
	<b>Total</b>	<b>—</b>	<b>81.00</b>	<b>—</b>	<b>75.28</b>	<b>156.28</b>
(iii) Golder Associates	— services for study, proposal design, supervision and monitoring for the spillway by individual experts of varying smaller period	—	17.33	—	—	17.33
(iv) Individual Consultant	— senior construction engineer	—	10.00	—	12.0	22.00
— Mr. B.K. Mehara for dam						
	<b>Total</b>	<b>—</b>	<b>27.33</b>	<b>—</b>	<b>12.00</b>	<b>39.33</b>

Consultants Name/Type	Position	Person—Months Allocation (In Person—Months)			Variation	Ac Utiliz
		KOISP	Phase I	Phase II		
(v)	— construction management consultant	—	—	6.0	(1.5)	
	— animal husbandry	—	—	2.0	(2.0)	
	— animal husbandry	—	—	10.0	(10.0)	
	Total	—	0.00	18.00	(13.50)	
	Total for A	112.00	192.83	18.00	101.95	4

Consultants Name/Type	Position	Person—Months Allocation (In \$ '000)			Variation	Ac Utiliz
		KOISP	Phase I	Phase II		
B. Locally Recruited						
(vi) Messrs. Resources Development	— account consultancy for DOI	—	—	344.8 <sup>a</sup>	(142.8)	2
(vii) Project Benefit Monitoring and Evaluation	— benefit monitoring and evaluation	—	—	134.1	58.2	1
(viii) Draft Animal and Dairy Development Program	— livestock	—	—	15.5	(15.5)	
(ix) Project Programming (Land Commissioner's Department)	— project programming	—	—	87.7	(36.8)	
(x) Marketing (Land Commissioner's Department)	— marketing	—	—	78.1	(64.2)	
(xi) International Irrigation Management Institute for impact assessment study	— project impact assessment	—	—	114.1	—	1
	Total for B	0.00	0.00	774.30	(201.10)	5

<sup>a</sup> At exchange rate of \$ = SLRs 38.

**STATUS OF COMPLIANCE WITH LOAN COVENANTS**  
**As of 30 June 1995**

Reference to Loan Document	Covenant	Training	Status	Remarks
Schedule 6, paras. 2&3, LA	The Central Coordinating Committee and the Project Coordinating Committee established under Phase I will continue to be responsible for Project Coordination.	During Implementation	Complied with	
Schedule 6, paras. 4 & 5, LA	The two Project Managers for Phase I, i.e., the Project Manager (Irrigation) and the Project Manager (Settlement) will carry out corresponding responsibilities under the Project.	During implementation	Complied with	
	The Project Director for Phase I will serve in the same capacity to the Project.	During implementation	Complied with	
Schedule 6, para. 6, LA	The National Water Supply and Drainage Board (NWSDB) will assist Department of Irrigation (DOI) in the construction of the water supply system.	During implementation	Complied with	
Schedule 6, para. 31, LA	DOI will post a Senior Engineer (SE) to assist the Project Manager (Irrigation) with implementation matters.	During implementation	Complied with	
Schedule 6, para. 8, LA	Land Commissioner's Department (LCD) and Farmer's Organization (FD) will agree in writing on arrangements relating to the implementation of the social forestry component.	Before 31 Mar 1987	Complied with	
Schedule 6, para. 11, LA	LCD and Draft Animal and Dairy Development Program (DADDP) will enter into an agreement relating to the implementation of the livestock and dairy component.	Before 31 Mar 1987	Complied with	
Schedule 6, paras. 13 & 14, LA	Central Bank of Sri Lanka (CBSL) will enter into subsidiary agreements with Participating Banks for the implementation of the credit support component.	Before 31 Mar 1987	Complied with	

Reference to Loan Document	Covenant	Training	Status	Remarks
Schedule 6, para. 14, LA	CBSL will designate suppliers of two-wheeled tractors.	During implementation	Complied with	
Schedule 6, para. 17, LA	DOI will enter into an agreement with a local agency to carry out benefit monitoring and evaluation studies.	Before Mar 1987	Complied with	
Schedule 6, para. 9, LA	Woodlots will be made available to settlers selected on the basis of their willingness and capability to develop woodlots under a long-term lease agreement.	During implementation	Being complied with	
Schedule 6, para. 10, LA	Enlarged home lots will be made available to settlers selected on the basis of their willingness to keep dairy cattle and their livestock experience.	During implementation	Complied with	
Schedule 6, para. 12, LA	Adequate credit facilities will be made available to settlers for purchase of heifers to be provided under the Project. Proceeds from the purchase will be used as revolving fund for the procurement of additional heifers.	During implementation	Partly complied with	
Schedule 6, para. 14, LA	CBSL will monitor the performance of participating Banks.	During implementation	Complied with	
Schedule 6, para. 15, LA	The Project Director will submit to the Bank an overall training program.  The Project Director will submit to the Bank the qualifications of the proposed training candidates.  Training participants will serve the Project upon completion of the training for a reasonable period of time through bonding arrangements.	Before 30 Jun 1987	Complied with	
Schedule 6, para. 16, LA	CBSL will provide training facilities for training of staff from Participating Banks.	During implementation	Complied with	
Schedule 6, para. 18, LA	Irrigation Management Division (IMD) will carry out seasonal benefit monitoring.	During implementation	Complied with	
Schedule 6, para. 35, LA	Department of Agriculture (DOA) will provide adequate extension services in the field of on-farm water management, including on-farm water management for subsidiary food crops.	During implementation	Complied with	
Schedule 6, para. 38, LA	Lands and land rights required for civil works will be acquired.	During implementation	Complied with	

Reference to Loan Document	Covenant	Training	Status	Remarks
Schedule 6, para. 39, LA	Adequate land will be made available to DADDP for the establishment of the livestock service center.	During implementation	Complied with	
Schedule 6, para. 40, LA	"As-built" drawings will be prepared for all civil works under the Project-related irrigation development.	Not later than three months after completion of the works	Complied with	All drawings (LSs and CSs) for MC, BCs and DCs are completed. Also completed LSs for field canals.
	"As-built" drawings will be prepared for all civil works under the Project-related irrigation development.	Not later than 31 Dec 1987	Complied with	Prepared drawings destroyed in July 1987 have been reprepared.
Schedule 6, para. 41, LA	For precision land leveling equipment, DOI will make available equipment and experienced staff.	Not later than 31 Mar 1987	Complied with	
	Land leveling equipment will be for hire to interested farmers.	During implementation	Complied with	
Section 4.07, LA Schedule 6, paras. 19 & 20; Section 2.07 of PA	Progress reports will be prepared by the Executing Agencies and consolidated by the Project Director. The Project Director will submit the reports to the Bank	Quarterly during implementation	Being complied with	Latest report sent was as of Dec 1993.
Section 4.06, LA Schedule 6, paras. 19 & 20; Section 2.08 of PA	Financial statements will be prepared by the Executing Agencies and submitted to the Project Director. The Project Director will consolidate and submit the statements to the Bank.	Unaudited statements within 6 months after end of each fiscal year, audited statements within 9 months after end of each fiscal year.	Delayed compliance	1993 Audit under process. Report to be sent to the Bank by 31 Jul 1995. 1994 accounts being prepared to be submitted to the Bank by 31 Oct 1995.
Section 4.07, LA	A Project completion report will be prepared and submitted to the Bank.	Not later than three months after physical completion of the Project	Complied with	Submitted PCR on 12 Sep 94.
Section 4.09, LA Schedule 6, paras. 21 & 22, LA	All Project facilities will be adequately operated and maintained.	During and after implementation	Complied with	Funds allocated are inadequate
Schedule 6, para. 23, LA	DOI will assign adequate operation and maintenance (O&M) staff.	During implementation	Complied with	
	IMD will organize water user groups through posting of three project managers and fielding of institutional organizers, and will coordinate O&M related activities.	During implementation	Complied with	

Reference to Loan Document	Covenant	Training	Status	Remarks
Schedule 6, para. 24, LA	IMD will collect irrigation service fees to be placed in a Project O&M fund.	During and after implementation	Will not be complied with	No fees collected since 1986. Covenant superseded by covenants under Agriculture Program Loan.
Schedule 6, para. 12, LA	DADDP will establish Milk Producers Societies and a Milk Producers Union for O & M of the dairy facilities.	During implementation	Partially complied with	Four societies have been established. Milk Producers Union not established.
Schedule 6, para. 12 and 25, LA	DADDP will operate and maintain the livestock and dairy facilities.	During implementation until facilities have been handed over to Milk Producers Union	Complied with	
	Livestock and dairy facilities will be transferred to the Milk Producers Union; all dairy development cost will be recovered.	Before Project completion	Not complied with	
Schedule 6, para. 26, LA	The National Water Supply and Drainage Board will operate and maintain the water supply system; O&M cost will be fully recovered, for which purpose water consumption will be metered.	During and after implementation	Partially complied with	NWSDB is maintaining the schemes. Collection from the consumers is not enough to meet the O&M cost.
Schedule 6, para. 27, LA	Development cost related to field allotments and housing assistance provided to the settlers will be recovered.		Not complied with	Response is very poor. Issuance of grant for allotted lands to be done yet. Effort was lacking to recover housing loan.
Schedule 6, para. 28, LA	O&M cost of market facilities, produce stores, and staff quarters will be fully recovered through collection of rentals.	After completion	Complied with	Rentals for quarters are being collected through salary deductions; market facilities and produce stores handed over to Multipurpose Cooperative Societies.

Reference to Loan Document	Covenant	Training	Status	Remarks
Schedule 6, para. 29, LA	The irrigation service fee policies will be reviewed and the findings of the review will be discussed with the Bank.	Not later than 30 Sep 1987	Will not be complied with.	Superseded by covenants under the Agriculture Program Loan.
	A program of revision in irrigation fees will be introduced in consultation with the Bank.	Not later than 31 Dec 1988	Will not be complied with	Superseded by covenants under the Agriculture Program Loan.
Schedule 6, para. 32, LA	The Bank will be consulted with respect to development projects in the Kirindi Oya watershed.	During and after implementation		New development projects have not yet been taken up.
Schedule 6, para. 33, LA	Adequate hydrological monitoring program will be implemented.	Commissioning of the Tanamawila station not later than mid-1987	Being complied with	Tanamawila station started operation in Mar 1987; other two stations also in operation.
Schedule 6, para. 34, LA	A flood warning system and a dam safety monitoring program will be implemented.	Not later than 31 Dec 1987	Complied with	O&M Manual for dam and headworks and an emergency preparedness plan prepared; first comprehensive inspection of the dam and headworks carried out in 1990.
Schedule 6, para. 36, LA	Land use planning surveys will be carried out and action taken on them in consultation with the Bank.	During and after implementation	Complied with	Soil surveys started in Feb 1991.
Schedule 6, para. 37, LA	The area around the Lunugamwehera Reservoir will be declared a national park.	Not later than 30 Jun 1988	Being complied with	Necessary surveys to delineate the national park are completed. Proclamation is being prepared by the National Wild Life Department. To be accomplished by 15 Jul 1995.
Schedule 6, para. 42, LA	The Government will ensure appropriate support prices for subsidiary food crops.		Being complied with	

## **ECONOMIC EVALUATION**

1. The economic internal rate of return (EIRR) of the Project was recalculated on the basis of actual costs and estimated benefits accrued up to the time of the Mission's visit (June 1995). The EIRR of the entire Project and that of the individual components ("old area" and "new area") were computed separately. Indirect benefits (inland fisheries) and costs (salinity, losses to prawn fisheries) were included in the analysis.

### **A. Data Sources and Methodology**

#### **1. Costs and Benefits**

2. Project investment costs were obtained from the Annual Accounts, Progress Reports, and other relevant records of the primary Executing Agency, the Department of Irrigation (DOI). Production costs were obtained from publications of the Department of Agriculture (DOA), as well as other baseline, midterm, and end of Project surveys conducted for the Project. All available reports, studies or relevant documents were examined to obtain cost and benefit data with and without Project conditions. This was further supplemented by the current information on the above provided to the Mission by the Project Executing Agency.

3. Data on indirect benefits and costs were obtained from special studies undertaken for the Project Benefit Evaluation Study completed by the International Irrigation Management Institute (IIMI). Direct benefits from both livestock and forestry production were estimated from the data obtained from the various studies and surveys conducted for the Project. Discussions with farmers, officials, and other Project beneficiaries, and field visits enabled the Mission to reconfirm or revise and update such data.

#### **2. Price Level**

4. The analysis was undertaken in current Sri Lankan rupee (SLRs) prices, converted to dollars using the prevailing average exchange rates and then escalated to 1994 prices using the G-5 Manufacturing Unit Value (MUV) index. For costs and benefits for which past data were not available, the current year's (1994) values were deflated using the gross domestic product (GDP) (agriculture sector) deflator. Specifically, the GDP deflation was used in estimating past operation and maintenance (O&M) costs, indirect costs, and benefits such as losses in salinity and prawn fisheries, and incremental benefits from freshwater fisheries, transport, handling and storage costs in determining economic and financial farm-gate prices of paddy and fertilizers, and cost of production of other field crops (OFCs). Projections of costs and benefit streams for the period 1995-2040 were in constant 1994 prices.

#### **3. Conversion Factors**

5. Conversion factors used in the analysis were estimated for the Department of National Planning, Sri Lanka, by Bradford University, UK.<sup>a</sup> Investment costs of dam, distributory system, rehabilitation, and O&M were disaggregated to labor, materials, machinery, and transport using a sample area analysis provided by DOI. The conversion factors were then applied to the four components to arrive at the economic costs. Other costs that could not be broken down to the three basic components were converted using the sectoral conversion factors (SCF). SCF

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<sup>a</sup> *Report on Shadow Prices for Sri Lanka, Bradford University, UK, 1991.*



used for estimating the economic benefits were as follows: scarce labor 0.785, surplus labor 0.722, machinery and equipment 0.776, materials 1.05, transport 0.814, roads and building 1.06, agricultural and land development/settlement 0.785, livestock 0.774, forestry 0.841, seed 0.87, and chemicals 0.65.

#### **4. Commodity Prices**

6. The economic prices of nontraded goods were estimated using domestic prices converted by SCF. The economic prices of traded commodities such as paddy and fertilizers were estimated using world market (border) prices suitably adjusted for local costs of handling, transport, and storage. World Bank commodity forecasts were used for projecting fertilizer and rice prices beyond 1994.

7. In the case of OFCs, for which world market prices were difficult to obtain for past years, it was decided to use SCF to determine economic costs and returns. Economic costs and benefits of livestock and forestry were also estimated using SCF.

#### **5. Project Life**

8. The Project officially commenced in 1978, but was temporarily halted because of cost escalation. It restarted in 1982 after reformulation. The initial release of water from the reservoir was made in 1986/87, and the Project became partly operational in 1987/88 and fully operational in 1989/90. The Project life was therefore estimated at 50 years beginning 1990.

### **B. Major Assumptions**

9. Assumptions made for the analysis are as follows:

- (i) The base case analysis assumes that paddy would be the main crop with OFCs being grown on 7-20 percent of the land. The cropping intensity of paddy is assumed to be 196 percent in the old area and 148 percent in the new area after 1995. The cropping intensity of OFC is assumed at 7 percent in the old area and about 20 percent in the new area (inclusive of highland rainfed crops). Without the Project, it is assumed to be 130 percent in the old area beginning 1981.
- (ii) Since rehabilitation of the old area started in 1978, additional benefits from this area is estimated to have commenced in 1980/81. The full benefits from the old and new areas are estimated to have begun after the release of water from the reservoir in 1986/87.
- (iii) Fertilizer use is expected to increase from 360 kilograms (kg)/hectares (ha) in 1994 to 420 kg/ha in year 2010 and remain constant thereafter. Without the Project, it is assumed to remain at the 1994 level.
- (iv) OFCs have been categorized into OFC 1 and OFC 2. OFC 1 are high-cost, high income crops and OFC 2 are low-cost low-income crops. Up to the present, about 70 percent of OFC grown fall under OFC 2. It is assumed that after 1995 the ratio of OFC 1:OFC 2 grown would be 40:60.

- (v) It is assumed that there is no incremental benefit from *chena* and highland cultivation. It is not unreasonable to do so, as a similar area or less is under such cultivation after the Project.
- (vi) It is assumed that incremental returns from livestock would be obtained only from the new area. There has been a reduction in the herd in the old area and it is likely that this trend will continue because of the reduction in the grazing area. In the new area, milk yields are expected to increase at the rate of 0.5 percent for cattle and 0.3 percent for buffaloes. The cattle and buffalo population are also expected to increase at the same rates, respectively. The proportion of cattle and buffalo for milking is expected to rise by 0.5 percent annually from 40 percent and 35 percent, respectively. Livestock income has been estimated from milk, meat, and curd production.
- (vii) The economic benefits of the forestry component of the Project comes mainly from the woodlot program. Only 250 ha were planted under the program, with a stocking rate of 950-975 trees/ha. Twenty-five percent of this timber would be removed before the 25th year for use as small timber, poles, and fuelwood. This is valued at SLRs4,000/ha. The balance of the area, if allowed to grow to 30 years, would yield 720 trees/ha. At an average price of SLRs2,000/tree, the benefit per ha would be SLRs1.44 million or SLRs360 million for the whole area planted. The planting cost is assumed to be in the region of SLRs7,000-10,000/ha per annum for three years. It is assumed that an additional 150 ha would be brought under woodlots over the next six years.
- (viii) Total investment has been assigned to the two areas according to the proportion of Lunugamwehera reservoir water use. The old area obtained 25 percent of the water through direct deliveries and 10 percent from reuse of drainage flows. Therefore, 35 percent of the investment costs was assigned to the old area, and 65 percent to the new area.
- (ix) Indirect costs and benefits have been included. Losses due to salinity are assumed at SLRs6 million/year, losses to prawn fisheries at SLRs8 million/year, and benefits from inland fisheries at SLRs5 million/year.

### **C. Economic Benefits and Costs**

10. The direct benefits included in the analysis are incremental benefits from an increase in the cropping intensity and yields in the old area. In the new area, the benefits are from (i) the entire paddy production, (ii) OFC production, (iii) livestock production, and (iv) forestry plantations. Indirect benefits included in the analysis are the incremental production of inland fish. The indirect costs included are (i) losses from prawn fisheries, and (ii) losses due to salinity.

#### **1. Paddy**

11. Crop production in the Project is shown in Table 1. Paddy production prior to the Project was estimated at about 30,000 tons (t) per annum. The revised 1994 production is estimated at 65,000 t. In 1995, production is expected to about 80,000 t. The incremental

production is 50,000 t against a target at appraisal estimated at 44,000 t. Cropping intensity in 1994/95 is 194 percent in the old area and 185 percent in the new area, and exceeds the target of 170 percent for both areas estimated at appraisal. However, the analysis assumes that average cropping intensity will be 170 percent for the entire project beyond 1995. The average yield in both areas is expected to increase from about 3.8 t/ha in 1994 to 5.2 t/ha in the year 2000 and to remain constant thereafter. Without the Project, the yield remains at 2.9 t/ha. The cost of production of paddy remains at SLRs22,000/ha without the Project, but increases to SLRs23,900/ha with the Project in the year 2010.

## **2. OFC**

12. The incremental output of OFC increased from about 400 t in 1989 to 2,000 t in 1995 (17 percent of the appraisal estimate of 11,400 t). The incremental area under OFC increased from 370 ha in 1989 to 1,800 ha in 1995. It is assumed that beyond 1995, the area under OFC will be approximately 1,400 ha/annum, and yields will be 2 t/ha for OFC 1 and 1 t/ha for OFC 2. The yield without the Project is 1.2 t/ha and 0.5 t/ha, respectively, in the old area. The above includes both irrigated and rainfed cultivations. Under conditions of good water availability, the area under irrigated OFC declines because of preference for the cultivation of paddy. In *yala* 1995, the area under irrigated OFC was estimated at 100 ha. Therefore, a reduced area has been assumed for the future.

## **3. Livestock**

13. Survey data have shown that livestock population declined after the Project, mainly because of the reduced grazing area. Milk yields also dropped from 1.1 liters/day for cattle and 0.94 liter/day for buffalo in 1985/86 to 0.88 liter/day and 0.76 liter/day, respectively, in 1990. From 1990 onwards, milk yields have increased and have reached 1 liter/day for cattle and 0.8 liter/day for buffaloes. While the traditional system of an extensive system of management in jungles and common grazing area continues in the old areas, more intensive management with one or two high quality animals is being promoted in the new as well as the old areas. As progress of this program is linked to the supply of improved animals, which is a slow process, a conservative estimate of the increase in yields and output has been assumed for the future.

## **4. Forestry**

14. The area under woodlots was about 60 percent of the appraisal estimates. It is assumed that the balance of the area earmarked for woodlots (150 ha) will be developed over the next four to five years. Benefits from the above have been included in the analysis. Home lot programs have not been successful and no benefits have been assumed from this program. Apart from the above, the roadside plantations, which have been a success, will provide benefits by improvements to the environment as well as by serving as windbreaks. Such benefits are not easily quantifiable.

## **5. Indirect Benefits/Costs**

15. The production of inland fish is estimated to have increased from 59,000 kg/annum without the Project to 550,900 kg/annum with the Project. The catch per fisherman had increased from 1,900 kg/annum to 4,300 kg/annum with the Project. The cost of production is estimated at SLRs25,000/annum per fisherman. Taking an average price of fish of SLRs12/kg, the value of production has increased from SLRs0.7 million to SLRs6.5 million with the Project. The incremental value of production due to the Project could be assumed to be approximately

SLRs5 million annually, if the natural increase without the Project is reduced from the incremental value. The net income per fisherman exclusive of own labor is estimated to have increased from SLRs15,000/annum to SLRs40,000/annum with the Project.

16. The cost of salinity has been estimated on the basis of a yield reduction in paddy averaging 20 bushels/acre (1,038 kg/ha), or SLRs7,710/ha for 1,000 acres (400 ha) of affected lands at the current paddy price of SLRs7.50/kg. The total loss is estimated at SLRs3.1 million/annum. The losses from the reduction of prawn fisheries have been estimated at SLRs8 million annually. About 400 fishermen earning a net income of SLRs20,000/annum have lost their livelihood.

#### D. Results of Evaluation

17. The EIRR of the Project was recalculated on the basis of the above assumptions, for the period 1978-2040, using actual costs and benefits accrued up to 1994/1995. The results are shown in Table 2:

**Table 2: EIRR and Sensitivity Analysis**

Component	Cropping Intensity (%)		EIRR	FIRR
	Paddy	OFC <sup>a</sup>		
<b>A. Base Case</b>				
Old Area	196	7	10.47	5.20
New Area	148	20	<u>4.70</u>	<u>1.53</u>
Both			6.33	2.82
<b>B. Lower Cropping Intensity</b>				
Old Area	170	7	9.07	4.71
New Area	120	20	<u>4.04</u>	<u>1.05</u>
Both			5.63	2.34
<b>C. Higher Cropping Intensity</b>				
Old Area	200	7	10.58	5.28
New Area	200	10	<u>5.61</u>	<u>2.11</u>
Both			6.93	3.17
<b>D. Benefits Decline by 10%</b>				
Old Area	196	7	9.99	4.81
New Area	148	20	<u>4.32</u>	<u>1.21</u>
Both			5.93	2.47

<sup>a</sup> Includes OFC cultivated under rainfed conditions on highlands.

18. The recalculated EIRR of the overall Project cost was estimated at 6.33 percent. It was 10.5 percent for the old area and 4.7 percent for the new area. The financial internal rate of return (FIRR) was less than the EIRR. The projected EIRR of the KOISP in 1977 was 17.6

percent. The 1982 reformulated Project estimated the EIRR of Phase I at 11 percent and Phases I and II together at 13.6 percent. The 1986 appraisal of Phase II of the Project estimated the EIRR at 19 percent. The actual EIRR was substantially lower than any of the projected figures.

19. The reasons for the shortfall are many.
  - (i) The entire planned area was not developed because of lack of water.
  - (ii) The output price increases have not kept pace with input price increases.
  - (iii) The investment cost of the project was high.
  - (iv) The projected cropping intensity was not achieved except in 1995, when the reservoir spilled.
  - (v) A serious drought situation prevailed for a prolonged period after the reservoir became operational.
  - (vi) Institutional aspects, particularly, the strengthening of farmer organizations, was not given priority.
  - (vii) The optimal productivity of the irrigated land could not be achieved because of damage caused by unregulated cattle grazing and nonresidency of about 20 percent of the settlers.
20. The present estimate is considered somewhat optimistic, based on the poor cropping intensity experienced in the recent past.

21. Sensitivity analysis shows that even with full cultivation in both seasons in both areas, the EIRR increased only to 6.93 percent. A 10 percent decline in the benefits reduces EIRR to 5.93 percent. If the cropping intensity is reduced in both areas, the EIRR falls to 5.63 percent. The EIRR is sensitive to cropping intensity, and declines in output price.

## **E. Farm Incomes**

22. Farm incomes have not risen with the implementation of the Project. The pre-Project income for paddy in current prices was approximately SLRs2,000/ha in 1987. The current (1993/94) income from paddy is estimated at SLRs5,300/ha (when family labor is included in cost). In constant 1994 prices, the income in 1987 was SLRs12,000/ha. In real terms, income from paddy production has fallen because of the steep rise in input prices.

23. The Project has not had much impact on the beneficiaries in terms of net return from a unit of land cultivated, but it has enabled farmers in the old area to increase the area cropped and thus increase total annual income. Similarly, in the new areas, landless farmers have been able to increase their total income. Those farmers who lived in the area (alternate settlers) and received only income from *chena* cultivation or rainfed farming also benefited from more stabilized farming. Supporting statistical data relating to net benefit cash flow in constant 1994 economic prices and cost and benefit streams of the old and the new areas given in Tables 3 to 5.

Table 3: Area Cultivated and Production

Crop Year	Paddy				KOISP Incremental OFC	
	Old Area		New Area		Area (ha)	Production (000 t)
	Area (ha)	Production (000 t)	Area (ha)	Production (000 t)		
1977	6,674	19.9				
1978	6,712	20.1				
1979	6,750	19.1				
1980	6,788	21.9				
1981	6,826	27.3				
1982	6,714	30.2				
1983	6,902	28.5				
1984	6,940	24.6				
1985	6,978	28.4				
1986	7,576	31.2	879	2.1		
1987	9,182	38.4	2,406	9.9		
1988	9,182	38.0	6,718	24.6		
1989	7,847	32.6	6,311	26.2	370	0.394
1990	9,182	39.5	2,428	10.2	297	0.344
1991	9,182	41.0	4,450	17.4	2,216	2.025
1992	5,441	24.1	5,038	19.1	539	0.635
1993	5,542	24.0	4,480	16.9	2,634	2.749
1994	9,005	34.2	8,511	31.6	2,377	2.555
1995	9,340	39.2	9,774	41.1	1,774	2.093
1996	9,480	41.7	7,906	34.8	1,407	1.979
1997	9,480	43.6	7,906	36.4	1,407	1.979
1998	9,480	45.5	7,906	37.9	1,407	1.979
1999	9,480	46.5	7,906	39.5	1,407	1.979
2000–2040	9,480	49.3	7,906	41.1	1,407	1.979

EIRR = 6.33%

Table 3: Net Benefit Cash Flow in Constant 1984 Economic Prices (\$ '000)  
Kirindi Oya Irrigation and Settlement Project - Sri Lanka

Year	Sri Lanka GDP (Agric) Deflator	Exchange Rate \$ = SLRs	MUV <sup>a</sup> Index	With Project			Without Project			Net Incremental Benefits
				Costs	Benefits	Net Benefits	Costs	Benefits	Net Benefits	
1978	0.11	14.95	1.954	3,265	7,582	4,317	2,708	7,329	4,622	(304)
1979	0.12	15.45	1.726	4,465	6,038	1,572	2,712	5,835	3,123	(1,551)
1980	0.15	18.00	1.573	8,413	7,881	(532)	2,331	7,606	5,275	(5,808)
1981	0.20	21.55	1.567	11,100	10,674	(425)	2,651	6,540	3,889	(4,314)
1982	0.22	21.32	1.591	14,803	7,740	(7,064)	2,764	4,286	1,521	(8,585)
1983	0.29	25.00	1.629	17,539	6,759	(10,779)	3,102	3,975	873	(11,653)
1984	0.36	26.28	1.664	21,917	5,675	(16,242)	3,399	3,855	457	(16,699)
1985	0.37	27.41	1.651	24,917	5,727	(19,190)	3,146	3,367	221	(19,411)
1986	0.40	28.52	1.400	13,712	5,435	(8,277)	2,712	2,795	83	(8,360)
1987	0.43	30.76	1.275	10,191	8,168	(2,024)	2,115	3,004	889	(2,913)
1988	0.48	33.03	1.188	10,733	12,150	1,417	2,170	3,449	1,280	137
1989	0.52	40.00	1.196	9,338	12,114	2,777	2,810	3,646	836	1,941
1990	0.69	40.24	1.132	7,675	8,754	1,079	2,258	3,142	885	194
1991	0.81	42.58	1.110	7,709	11,112	3,403	2,551	3,322	771	2,632
1992	0.90	46.00	1.080	6,562	7,129	567	2,555	2,912	357	210
1993	1.00	49.56	1.039	6,843	6,450	(393)	2,412	2,550	138	(531)
1994	1.00	49.69	1.000	7,847	10,531	2,684	2,250	2,771	521	2,163
1995	1.00	49.89	1.000	7,221	13,516	6,294	2,241	2,979	738	5,557
1996	1.00	49.89	1.000	6,591	13,508	6,917	2,241	3,111	869	6,048
1997	1.00	49.89	1.000	6,605	14,105	7,500	2,241	3,111	869	6,631
1998	1.00	49.89	1.000	6,619	14,701	8,082	2,241	3,111	869	7,213
1999	1.00	49.89	1.000	6,634	15,137	8,503	2,241	3,111	869	7,634
2000	1.00	49.89	1.000	6,754	17,530	10,776	2,241	3,439	1,198	9,578
2001	1.00	49.89	1.000	6,770	17,533	10,763	2,241	3,439	1,198	9,565
2002	1.00	49.89	1.000	6,785	17,536	10,750	2,241	3,439	1,198	9,552
2003	1.00	49.89	1.000	6,801	17,539	10,737	2,241	3,439	1,198	9,539
2004	1.00	49.89	1.000	7,006	17,542	10,536	2,241	3,439	1,198	9,338
2005	1.00	49.89	1.000	6,844	19,719	12,876	2,241	3,878	1,637	11,239
2006	1.00	49.89	1.000	6,860	19,723	12,863	2,241	3,878	1,637	11,226
2007	1.00	49.89	1.000	6,877	19,726	12,849	2,241	3,878	1,637	11,212
2008	1.00	49.89	1.000	6,893	19,729	12,836	2,241	3,878	1,637	11,199
2009	1.00	49.89	1.000	6,910	19,733	12,823	2,241	3,878	1,637	11,186
2010	1.00	49.89	1.000	6,912	19,737	12,825	2,241	3,878	1,637	11,188
2011	1.00	49.89	1.000	6,912	19,739	12,827	2,241	3,878	1,637	11,190
2012	1.00	49.89	1.000	6,912	19,741	12,829	2,241	3,878	1,637	11,192
2013	1.00	49.89	1.000	6,912	19,743	12,831	2,241	3,878	1,637	11,194
2014	1.00	49.89	1.000	7,100	19,745	12,645	2,241	3,878	1,637	11,008
2015	1.00	49.89	1.000	6,912	19,748	12,836	2,241	3,878	1,637	11,199
2016	1.00	49.89	1.000	6,912	19,748	12,837	2,241	3,878	1,637	11,200
2017	1.00	49.89	1.000	6,912	20,358	13,446	2,241	3,878	1,637	11,809
2018	1.00	49.89	1.000	6,912	20,360	13,448	2,241	3,878	1,637	11,811
2019	1.00	49.89	1.000	6,912	20,362	13,450	2,241	3,878	1,637	11,813
2020	1.00	49.89	1.000	6,912	20,365	13,453	2,241	3,878	1,637	11,816
2021	1.00	49.89	1.000	6,912	20,367	13,455	2,241	3,878	1,637	11,818
2022	1.00	49.89	1.000	6,912	20,369	13,457	2,241	3,878	1,637	11,821
2023	1.00	49.89	1.000	6,912	20,372	13,460	2,241	3,878	1,637	11,823
2024	1.00	49.89	1.000	7,100	20,374	13,274	2,241	3,878	1,637	11,637
2025	1.00	49.89	1.000	6,912	20,377	13,465	2,241	3,878	1,637	11,828
2026	1.00	49.89	1.000	6,912	20,683	13,771	2,241	3,878	1,637	12,134
2027	1.00	49.89	1.000	6,912	20,685	13,773	2,241	3,878	1,637	12,137
2028	1.00	49.89	1.000	6,912	20,081	13,169	2,241	3,878	1,637	11,532
2029	1.00	49.89	1.000	6,912	20,084	13,172	2,241	3,878	1,637	11,535
2030	1.00	49.89	1.000	6,912	20,390	13,478	2,241	3,878	1,637	11,841
2031	1.00	49.89	1.000	6,912	20,393	13,481	2,241	3,878	1,637	11,844
2032	1.00	49.89	1.000	6,912	20,395	13,483	2,241	3,878	1,637	11,846
2033	1.00	49.89	1.000	6,912	20,398	13,486	2,241	3,878	1,637	11,849
2034	1.00	49.89	1.000	7,100	19,794	12,694	2,241	3,878	1,637	11,057
2035	1.00	49.89	1.000	6,912	19,797	12,885	2,241	3,878	1,637	11,248
2036	1.00	49.89	1.000	6,912	19,800	12,888	2,241	3,878	1,637	11,251
2037	1.00	49.89	1.000	6,912	19,803	12,891	2,241	3,878	1,637	11,254
2038	1.00	49.89	1.000	6,912	19,806	12,894	2,241	3,878	1,637	11,257
2039	1.00	49.89	1.000	6,912	19,809	12,897	2,241	3,878	1,637	11,260
2040	1.00	49.89	1.000	6,912	19,812	12,900	2,241	3,878	1,637	11,263

<sup>a</sup> G-5 Manufacturing Unit Values Index - World Bank Commodity Projections, 1994.

EIRR = 10.47%

Table 4: KOISP - Cost and Benefit Stream - Old Area-Base Case - In Constant 1994 Economic Prices (\$'000)

Year	With Project							Without Project					
	Gross Benefits	Net Benefits	Prodn. Costs	O&M Costs	Rehab. Costs	Capital Costs	Net Indirect	Total Net	Gross Benefits	Prodn. Costs	O&M Costs	Total Net	Net Incremental
	Paddy	OFC a	Paddy				Benefits	Benefits	Paddy	Paddy		Benefits	Benefits
1978	7,582	0	2,756	44	3	93	0	4,686	7,329	2,664	44	4,622	64
1979	6,038	0	2,763	41	2	574	0	2,658	5,835	2,671	41	3,123	(465)
1980	7,881	0	2,373	41	0	2,094	0	3,373	7,606	2,290	41	5,276	(1,902)
1981	10,674	0	3,021	43	3	2,805	0	4,802	6,540	2,608	43	3,889	913
1982	7,740	0	3,088	50	68	4,050	0	482	4,286	2,714	50	1,521	(1,039)
1983	6,759	0	3,546	57	137	4,821	0	(1,802)	3,975	3,045	57	873	(2,675)
1984	5,675	0	3,908	69	119	6,227	0	(4,648)	3,855	3,330	69	457	(5,104)
1985	5,714	0	3,628	67	341	7,296	0	(5,618)	3,367	3,078	67	221	(5,839)
1986	5,077	0	3,166	63	238	3,450	0	(1,840)	2,795	2,649	63	83	(1,923)
1987	6,488	0	3,189	57	199	2,028	0	1,014	3,004	2,058	57	889	125
1988	7,368	0	3,282	49	43	1,679	0	2,316	3,449	2,121	49	1,280	1,037
1989	6,685	0	3,512	36	25	1,250	0	1,862	3,646	2,773	36	836	1,026
1990	6,974	0	3,437	38	0	1,117	(31)	2,351	3,142	2,220	38	885	1,466
1991	7,645	0	3,866	38	0	650	(33)	3,058	3,322	2,513	38	771	2,287
1992	3,947	0	2,288	23	0	699	(33)	903	2,912	2,532	23	357	547
1993	3,436	0	2,223	29	0	981	(33)	170	2,550	2,383	29	138	32
1994	5,327	0	3,349	28	0	435	(32)	1,482	2,771	2,221	28	521	961
1995	6,408	92	3,484	28	0	0	(32)	2,956	2,979	2,213	28	738	2,219
1996	7,115	126	3,544	28	0	0	(32)	3,638	3,111	2,213	28	869	2,769
1997	7,439	126	3,552	28	0	0	(32)	3,954	3,111	2,213	28	869	3,085
1998	7,762	126	3,559	28	0	0	(32)	4,269	3,111	2,213	28	869	3,400
1999	7,924	126	3,567	28	0	0	(32)	4,423	3,111	2,213	28	869	3,554
2000	9,298	126	3,633	28	0	0	(32)	5,732	3,439	2,213	28	1,198	4,534
2001	9,298	126	3,641	28	0	0	(32)	5,724	3,439	2,213	28	1,198	4,525
2002	9,298	126	3,650	28	0	0	(32)	5,715	3,439	2,213	28	1,198	4,517
2003	9,298	126	3,659	28	0	0	(32)	5,706	3,439	2,213	28	1,198	4,508
2004	9,298	126	3,667	28	0	66	(32)	5,632	3,439	2,213	28	1,198	4,433
2005	10,484	126	3,682	28	0	0	(32)	6,869	3,878	2,213	28	1,637	5,232
2006	10,484	126	3,691	28	0	0	(32)	6,860	3,878	2,213	28	1,637	5,223
2007	10,484	126	3,700	28	0	0	(32)	6,851	3,878	2,213	28	1,637	5,214
2008	10,484	126	3,709	28	0	0	(32)	6,842	3,878	2,213	28	1,637	5,205
2009	10,484	126	3,718	28	0	0	(32)	6,833	3,878	2,213	28	1,637	5,196
2010	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2011	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2012	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2013	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2014	10,484	126	3,719	28	0	66	(32)	6,766	3,878	2,213	28	1,637	5,129
2015	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2016	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2017	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2018	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2019	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2020	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2021	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2022	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2023	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2024	10,484	126	3,719	28	0	66	(32)	6,766	3,878	2,213	28	1,637	5,129
2025	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2026	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2027	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2028	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2029	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2030	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2031	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2032	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2033	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2034	10,484	126	3,719	28	0	66	(32)	6,766	3,878	2,213	28	1,637	5,129
2035	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2036	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2037	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2038	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2039	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195
2040	10,484	126	3,719	28	0	0	(32)	6,832	3,878	2,213	28	1,637	5,195

\* OFC - Other Field Crops

Note: Incremental O&M during the Project construction period is provided under Capital Costs. O&M costs with and without project beyond 1994 were taken to be identical on the assumption that farmers will provide additional inputs for O&M through their participation. The value of their input, difficult to estimate, was dealt with by sensitivity analysis. Both a constant and increasing level of incremental O&M were analyzed. Results indicate little sensitivity of the EIRR to such increases. For example, doubling the O&M cost, with project after 1995, reduces the EIRR from 6.33 percent to 6.30 percent.



EIRR = 4.70%

Table 5: KOISP - Cost and Benefit Stream - New Area - Base Area  
In Constant 1994 Prices (\$'000)

Year	Gross Benefits Paddy	Net Benefits Forestry	Net Benefits OFC *	Net Benefits Livestock	Net Indirect Benefits	Prod'n Costs Paddy	Benefits Foregone	Capital Costs	O & M Costs	Net Incremental Benefits
1978	0	0	0	0	0	0	195	173	0	(368)
1979	0	0	0	0	0	0	20	1,066	0	(1,086)
1980	0	0	0	0	0	0	17	3,888	0	(3,905)
1981	0	0	0	0	0	0	18	5,209	0	(5,227)
1982	0	0	0	0	0	0	24	7,522	0	(7,546)
1983	0	0	0	0	0	0	24	8,954	0	(8,978)
1984	0	0	0	0	0	0	30	11,564	0	(11,594)
1985	0	0	0	13	0	0	35	13,550	0	(13,572)
1986	344	0	0	14	0	312	29	6,407	47	(6,437)
1987	1,665	(1)	0	16	0	881	27	3,767	43	(3,038)
1988	4,770	(1)	0	14	0	2,501	25	3,118	38	(899)
1989	5,367	(1)	52	12	0	2,141	23	2,321	30	914
1990	1,800	(2)	61	9	(57)	951	24	2,075	33	(1,272)
1991	3,239	(2)	295	30	(62)	1,886	29	1,206	34	345
1992	3,131	(2)	126	22	(62)	2,201	31	1,298	22	(336)
1993	2,422	(2)	684	5	(62)	1,732	31	1,821	27	(563)
1994	4,914	(2)	380	3	(59)	3,166	33	809	26	1,202
1995	6,706	0	364	36	(59)	3,646	33	0	31	3,338
1996	5,934	0	384	40	(59)	2,955	33	0	31	3,279
1997	6,204	0	384	43	(59)	2,962	33	0	31	3,546
1998	6,473	(1)	384	48	(59)	2,968	33	0	31	3,812
1999	6,743	(1)	384	52	(59)	2,975	33	0	31	4,080
2000	7,754	1	384	57	(59)	3,030	33	0	31	5,044
2001	7,754	1	384	59	(59)	3,037	33	0	31	5,039
2002	7,754	1	384	62	(59)	3,044	33	0	31	5,035
2003	7,754	1	384	65	(59)	3,051	33	0	31	5,031
2004	7,754	1	384	68	(59)	3,058	33	122	31	4,904
2005	8,743	1	384	71	(59)	3,070	33	0	31	6,007
2006	8,743	1	384	75	(59)	3,078	33	0	31	6,003
2007	8,743	1	384	78	(59)	3,085	33	0	31	5,998
2008	8,743	1	384	81	(59)	3,093	33	0	31	5,994
2009	8,743	1	384	85	(59)	3,101	33	0	31	5,990
2010	8,743	1	384	89	(59)	3,101	33	0	31	5,993
2011	8,743	1	384	91	(59)	3,101	33	0	31	5,995
2012	8,743	1	384	93	(59)	3,101	33	0	31	5,997
2013	8,743	1	384	95	(59)	3,101	33	0	31	5,999
2014	8,743	1	384	97	(59)	3,101	33	122	31	5,879
2015	8,743	1	384	99	(59)	3,101	33	0	31	6,004
2016	8,743	0	384	102	(59)	3,101	33	0	31	6,005
2017	8,743	607	384	104	(59)	3,101	33	0	31	6,614
2018	8,743	607	384	106	(59)	3,101	33	0	31	6,616
2019	8,743	607	384	109	(59)	3,101	33	0	31	6,618
2020	8,743	607	384	111	(59)	3,101	33	0	31	6,621
2021	8,743	607	384	113	(59)	3,101	33	0	31	6,623
2022	8,743	607	384	116	(59)	3,101	33	0	31	6,626
2023	8,743	607	384	118	(59)	3,101	33	0	31	6,628
2024	8,743	607	384	121	(59)	3,101	33	122	31	6,508
2025	8,743	607	384	123	(59)	3,101	33	0	31	6,633
2026	8,743	910	384	126	(59)	3,101	33	0	31	6,939
2027	8,743	910	384	128	(59)	3,101	33	0	31	6,942
2028	8,743	303	384	131	(59)	3,101	33	0	31	6,337
2029	8,743	303	384	134	(59)	3,101	33	0	31	6,340
2030	8,743	607	384	136	(59)	3,101	33	0	31	6,646
2031	8,743	607	384	139	(59)	3,101	33	0	31	6,649
2032	8,743	607	384	142	(59)	3,101	33	0	31	6,652
2033	8,743	607	384	144	(59)	3,101	33	0	31	6,654
2034	8,743	0	384	147	(59)	3,101	33	122	31	5,928
2035	8,743	0	384	150	(59)	3,101	33	0	31	6,053
2036	8,743	0	384	153	(59)	3,101	33	0	31	6,056
2037	8,743	0	384	156	(59)	3,101	33	0	31	6,059
2038	8,743	0	384	159	(59)	3,101	33	0	31	6,062
2039	8,743	0	384	162	(59)	3,101	33	0	31	6,065
2040	8,743	0	384	165	(59)	3,101	33	0	31	6,068

\* OFC - Other Field Crops

# ACTION PLAN

## **Kirindi Oya Irrigation and Settlement Project**

[Financed by the Democratic Socialist Republic of Sri Lanka, Asian Development Bank (ADB), International Fund for Agricultural Development (IFAD), and Kreditanstalt für Wiederaufbau (KfW)]

**Prepared by the ADB Project Completion Review Mission, 15-30 June 1995**

Background	Actions To Be Taken		Agency	Time Frame
<p><b>A. Project Management Arrangements</b></p> <p>The physical implementation of the Project has been accomplished through a coordinated mechanism. The full realization of benefits and sustainability of the activities hinge on further coordinated management decisions and operation of facilities. In view of the unique nature of the Project, coordination will continue to have a critical role in managing, operating, and maintaining (MOM) the facilities and in attaining Project objectives. For example, promotion of other field crops (OFC) cultivation depends on scheduled delivery of required quantum of water, extension services in respect of OFC cultivation in highland and lowland with respective suitability of high-income OFC (chili and onion) and low-income OFC (green gram, cowpea, gingelly, etc.), assistance in marketing, and policy decisions pertaining to price stability. Likewise, acceleration of livestock development depends on coordinated action of Land Commissioner's Department (LCD), other Government agencies and the Department of Livestock (DOL) pertaining to identification and allocation of suitable pasture, downsizing of herds, minimizing damage to crops, etc. Same applies to crop diversification efforts. Thus, it is necessary, in view of the special need of KOISP, to ensure special coordinated Project management efforts.</p>	<p>(i) The institutional arrangement of Central Coordination Committee (CCC), evolved during construction phase, should be continued for at least the next three years (FY 1995/96 to 1997/98) for efficient MOM.</p>		Ministry of Irrigation, Power and Energy (MOIPE)	Immediate
	<p>(ii) A Kirindi Oya Project Management Committee (KOPMC) at the project level is to be specified under Section 5A of the Irrigation (Amendment) Act No.13 of 1994. KOPMC is to be headed by the Project Manager of IMD and to be composed of relevant line departments and agencies,<sup>a</sup> NGOs/beneficiary groups, as appropriate and as specified by the above Act, in addition to representatives from the Offices of Divisional Secretaries.</p>		MOIPE	-do-
	<p>(iii) The four Sub-Project Management Committees (SPMCs) and Drainage Channel Organizations (DCOs) currently functioning in the Project area should be institutionalized, strengthened, and made effective under the chairmanship of farmers' representatives and their mandate should be broadened.</p>		Irrigation Management Division (IMD)	-do-
	<p>(iv) The annual operational plan, including policy changes, targets, financial estimates and administrative arrangements of each line department and agency with regard to the Project components, is to be prepared and submitted to KOPMC at least three months prior to commencement of each fiscal year. Once approved by KOPMC, the plan is to form the basis for budget preparation by line departments and agencies concerned.</p>		MOIPE/IMD	From FY 1996

a Among others, representation in KOPMC should include the Chief Resident Engineer of DOI, senior District-level officials of LCD, Assistant Director (Agriculture) and Agriculture Officer (Extension) of DOA, Assistant Commissioner (Agrarian Services) of the Department of Agrarian Services, District Livestock Officer of DOL, District Forestry Officer, besides banks, credit institutions, representatives of Farmer Organizations (FOs), etc.

Background	Actions To Be Taken		Agency	Time Frame
<p><b>B. Irrigation-Related Issues</b></p> <p>The system developed under the Project is in a position to perform significantly better compared with current realizations and may exceed some of the Project targets provided availability and release of water from Lunugamwehara reservoir are at the level of Bank estimates made in 1982 and 1986. However, the benefits accruing from Project investments largely depends on efficient system operations under both the scenario of low and adequate level of water releases. Unless this can be achieved, the Project area may experience a number of problems in the future. Actions to augment Project benefits and to address possible problems are, therefore, needed.</p> <p>The Project has reached a stage where timely maintenance is important. During the Project Management Committee (PMC) meeting of 22 June 1995, a number of FO leaders emphasized the need for the same. The Mission considers that DOI should have the required capability in terms of fund and equipment.</p>	(v) KOPMC is to have its terms of reference in relation to efficient Project management. Among others, KOPMC is to meet at least thrice every cultivation season, if not needed more, to review implementation performance in relation to the annual operational plan and to take remedial measures, as needed.		IMD	Immediate
	(i) In strengthening FOs, due consideration needs to be given to ensure that cultivation is undertaken on a timely basis and the rotational water issues are adhered to, keeping in view structure protection and efficient system operations.		DOI/IMD	Maha season of 1996/97
	(ii) DOI to undertake an investigation to establish the reasons for inordinately high level of average duty in the new area [8.5 acre feet (acft)/acre] and to take technically suitable measures to reduce the same to normal level.		DOI	Immediate
	(iii) Based on quality analysis of drainage water flowing to the sea from new RB tract areas 5, 6, and 7, DOI may decide on feasible technical option for reuse of such water. Necessary funding for this may be ensured.		MOIPE/DOI	By 1996/97 Maha season
	(iv) Maintenance equipment procured under the Project, viz, crawler tractor (1), front-end loader (1), farm tractors (4) and motor grader (1), should always be retained in the Project Office, maintained properly, and used for the Project.		DOI	Immediate

Background	Actions To Be Taken		Agency	Time Frame
	(v) About 800 mm of water required for puddling (land preparation, soaking, and sowing), as experienced in D2 during <i>yala</i> of 1989, is excessively high. Though part of it may be a factor seepage, it would be appropriate for IMD/DOI to investigate the reasons, design appropriate interventions, and implement them to bring the level down.		IMD	By 1996/97 Maha season
	(vi) At the field level, the Office of the Project Managers of IMD under MOIPE need to be strengthened with adequate institutional, staff, and logistic support and assistance from higher levels. In addition to existing arrangements, irrigation engineers under DOI should also play an effective supportive role.		MOIPE	Immediate
<b>C. Drainage and Salinity-Related Issues</b> Primary drainage channels located within a field are maintained by FOs. Maintenance of secondary drainage channels running between two drainage channels (DCs) cannot be assigned to FOs. Their proper maintenance is important to ensure efficient drainage system operations and to minimize/eliminate the occurrence of salinity in the Project area. Under the existing system, the DOI office in the Project area can do this, but they do not have funds to do the same.	(i) Adequate budget allocation be made to enable DOI in the Project area to undertake drainage maintenance work on a planned and regular basis.		DOI	From FY 1996
Salinity problem is emerging both in RB and LB. It was found to be acute in the old area under LB. Drainage discharge problem caused by proximity to higher sea level. About 400 acres in the area have been affected. Field visits indicate that salinity coverage is increasing fast, impacting on cultivation. Introduction of salinity-tolerant paddy variety is not the response.	(ii) Prompt action to be taken to investigate the salinity situation and to design appropriate measures.		MOIPE/DOI	Immediate

Background	Actions To Be Taken		Agency	Time Frame
No administrative arrangements exist for collection and collation of data relating to salinity and monitoring of cultivation status of so-called saline plots. This needs to be done as the basic data framework depends on that. Ad hoc actions based on adequate data are not efficient.	(iii)	Data relating to salinity should be collected and collated regularly and cultivation status of plots monitored.	Divisional Secretaries/ IMD/DOI/Agricultural Research Unit (ARU) along with PMC	Immediate
<b>D. Farmer Organizations</b>				
FOs constitute the core beneficiary link in terms of Project objectives and activities. However, effectiveness of FOs was impaired significantly because of lack of regular involvement and participation in planning and execution of Project activities, problems pertaining to coverage, sharing of water from common distributary channel by settlers of different field channels, bureaucratic practices that evolved over time in the functioning DCOs, inactivity of field channel leaders, and inadequacy of link with farmers, existence of nonresident settlers, lack of opportunity for participation in decision-making committees, inadequate role of IMD, and lack of emphasis on institution-building at the early stage of system development. These deficiencies need to be corrected.	(i)	Project FOs to be made broad-based by assigning additional responsibilities related to infrastructure support, crop production, and marketing as well as other income-generation activities.	MOIPE in consultation with relevant ministries	Immediate
	(ii)	Two-way communication and cooperation between FOs and IMD through frequent site visits, increased dialogue with farm channel leaders, and FOs' participation in various Project committees may be institutionalized.	IMD	Immediate
	(iii)	A notification is to be issued by the Government, assigning a principal role to IMD for developing FOs with the cooperation and assistance of line departments and agencies concerned, more particularly in coordination with the Offices of Divisional Secretaries.	MOIPE	Immediate
	(iv)	IMD, in consultation with farmers and farm channel leaders, to evolve systems:	IMD	As soon as possible

Background	Actions To Be Taken		Agency	Time Frame
	(a) for transmission of farmers' views and opinion to higher level PMCs; (b) for adequate and timely communication of decisions taken by PMC and subcommittees to farmers; and (c) to monitor regularly their implementation performance.			
	(v) Administrative arrangements are firmed up to ensure that seasonal plans and programs, including those related to water allocation and release, as evolved and endorsed by various FOs (e.g., PMC and SPMCs) are given due consideration and implemented by agencies concerned.		IMD/DOI	Immediate
	(vi) Similar actions are to be taken with regard to additional activities to be assigned to FOs.		MOIPE in consultation with concerned ministries	Immediate
<b>E. Reservoir Operations</b> Efficient operations of the Lunugamwehera reservoir have significant importance in the light of prolonged drought and reduction of inflow. Efficiency is to be achieved through better analysis of available data relating to reservoir operations.	To ensure that data regularly collected on discharges such as sluice discharge, variation in tank water level, reservoir inflow, and rainfall are analyzed and used to arrive at corrective measures.		DOI	Immediate
<b>F. Water Release</b> After prolonged drought situation, the water reservoir situation in Lunugamwehera reservoir has improved considerably during 1993/94 and 1994/95. Current favorable water level positions may cause adverse impact both on crop diversification as well as OFC cultivation. It is important that water issue matters are promptly simplified and finalized with the objective of attaining regulated rotational issue of water and conservation of a part of it. A primary activity in	(i) Water issue policies and procedures are to be simplified and delineated, and explained to operational staff and FOs.  (ii) Water from the reservoir are to be issued appropriately, strictly based on such policies and procedures keeping in view the cropping pattern agreed upon with FOs.		DOI  DOI	Immediate  Immediate

Background	Actions To Be Taken	Agency	Time Frame
<p>this regard is for Divisional Secretaries and IMD to talk to the Project FOs in <i>kanna</i> meetings and obtain agreement as to the cropping pattern to be followed in a particular season and issuance of water on rotational basis.</p>	<p>(i) Necessary budget provision for regular monitoring of water quality in OEIS needs to be ensured. Though a water quality monitoring system is in place, its implementation since 1994 was affected by lack of budget provision (earlier, it was financed under a Bank loan).</p>	DOA	From FY 1996
<p><b>G. Water Quality in Tanks</b> Leached out soluble salts from the new irrigation system (NIS) are being deposited in five tanks that service old Ellegala irrigation system (OEIS). This has impacted on the quality of irrigation water (Class I) in the Ellegala command area. The failure to repair and maintain the drainage network that was damaged by 1969 floods has accentuated the problem.</p>	<p>(ii) Based on such monitoring, the necessary release of water from Lunugamwehera reservoir should be planned to ensure required level of dilution.</p>	DOA/DOI	Immediate
<p><b>H. Cattle Grazing Problem</b> During field visits, discussions with individual farmers, and meeting with PMC, it was established that unregulated cattle grazing is the most significant adverse development affecting the Project. It damages structures (such as dam slope, irrigation channels, etc.) requiring their frequent maintenance. OFC cultivation has been significantly affected by such unregulated cattle grazing. PMC members opined that unless this issue is immediately tackled based on a comprehensive view of the problem, the Project's sustainability may be endangered.</p>	<p>(iii) The drainage congestion in the Tissa and Yoda Wewa command areas should be cleared of obstacles for better outflow.</p>	DOI	Immediate
	<p>Government to undertake a comprehensive study of the problem and to come up with remedial actions.</p>	MOIPE/Ministry of Agriculture, Land and Forests (MOALF)/LCD/ Offices of the Divisional Secretaries	Immediate



Background	Actions To Be Taken		Agency	Time Frame
<p><b>I. Allocations for Operation and Maintenance</b></p> <p>Allocation for operation and maintenance has been low all through. The bulk of such allocations is charged to administrative overheads. Consequently, the structures constructed and facilities built are rapidly deteriorating to a position of disrepair. Urgent actions are, therefore, needed to redress the position.</p>	<p>(i) All executing departments/agencies should immediately prepare a report on the status of operations of structures and facilities built under the Project and identify their maintenance needs based on classification as "critical," "immediate," and "routine." Such estimates are to be quantified in rupee terms and submitted to the Planning and Finance Departments at least three months prior to commencement of the next financial year (FY 1996).</p> <p>(ii) To ensure that required funds for "critical" and "immediate" repairs are provided under the budget for FY 1996.</p> <p>(iii) Subsequently, allocation of funds under the budget for "routine" maintenance of Project facilities should be given priority by the Government.</p>		<p>All Executing Agencies (EAs) concerned</p> <p>Ministry of Finance and Planning (MOFP) and other ministries concerned - do-</p>	<p>Immediate</p> <p>FY 1996</p> <p>FY 1997 onwards</p>
<p><b>J. Agricultural Extension Services</b></p> <p>DOA had a grass-root level extension system. The interactions between village extension workers and contact farmers and through contact farmers to follower farmers, which was the basis of training and visit concept of extension services, are no longer being practiced. According to ILMI's Impact Assessment Report of 1995, only "4 percent of the farmers received one visit every month, 45 percent had only one visit per season, and 51 percent had no extension contact during 1993."</p>				

Background	Actions To Be Taken	Agency	Time Frame
MOALF explained that under the National Policy Framework (NPF) adopted by the Government, streamlining of agricultural extension services, including the provision of supportive services and inputs, is aimed at. The whole approach is geared to provide extension and related services through FOs. The objective is to institutionalize extension services at the grass-roots level. The Ministry also explained that since KOISP is an interprovincial scheme, all related extension works are being done by the Ministry with increased involvement of FOs, which are registered under the Agrarian Services Act. Instead of the earlier visit and training program, the current emphasis is to provide the services through FOs. The Directorate of Agricultural Extension Services has at the moment four AIs, two AOs and one AD in the Project area and all the four AIs are fully mobile.	(i) Prompt action is to be taken to operationalize the policies as embodied in the NPF with adequate attention to extension requirements of OFCs.	MOALF/DOA	Immediately after NPF gets fund approval
	(ii) Necessary directive to be issued to the AD to work in close collaboration with Project FOs including PMC, SPMC, and consisting of D-channel organizations and field channel organizations.	Directorate of Agriculture Extension (DAE)	Immediate
	(iii) The number of AIs in the Project area to be increased by two more.	MOALF	By 30 Sep 1995
	(iv) Close monitoring of the coverage of extension activities and their impact is to be undertaken on a semiannual basis.	KOPMC	Immediate
<b>K. Training and Research</b>  Training of farmers under the Project has been far short of what was envisaged at the design stage. Training had also been intermittent. IMI's Report of 1995 was negative on training performance. The same was corroborated during field visits.  About 20 demonstration plots have been developed in the Weerawila Training Center (WTC). Some of them are not appropriate. General upkeep of demonstration plots is rather poor.	(i) DOA to strengthen WTC with provision of staff, materials, and resources. Particular attention needs to be paid to strengthen top management of WTC.	DOA	Immediate
	(ii) To monitor closely the training program implemented by WTC.	DOA	Immediate
	(iii) To assess the impact of training by WTC on an annual basis and provide guidance to WTC to improve the program.	KOPMC	Immediate

Background	Actions To Be Taken		Agency	Time Frame
<p>ARU is not functioning properly. Its research lacks strategic focus related to Project situation. The positions of both research assistants are vacant. Hence, no regular research is undertaken.</p> <p><b>L. Drinking Water</b></p> <p>Drinking water is one of the successful components of the Project. However, both the level of charge (SLRs11/month per family) and actual collection have been low. To sustain the component, the charge needs to be reviewed and the collection performance improved.</p>	(iv)	The appropriateness of demonstration plots and their upkeep need to be assessed and suitable remedial measures taken.	DOA	Immediate
	(v)	A proper and strategically related research program needs to be operationalized for ARU.	DOA	Immediate
	(vi)	The positions of two research assistants be filled up.	DOA	Immediate
	(i)	The Government should, as required by loan covenants, undertake a review of current water charge and increase the same to a reasonable level immediately to meet O&M costs.	Water Supply and Drainage Board (WSDB)	Immediate
	(ii)	The collection performance should be reviewed by the Government to enhance efficiency.	WSDB	Immediate
	(iii)	Technical, financial and water resource implications should be given due consideration in deciding on possible requests for extension of the drinking water facilities outside the Project area.	WSDB/DOI	Immediate
<p><b>M. Social Forestry</b></p> <p>The social forestry component had mixed performance. Besides the smallness of the program, lack of preparedness to launch it, lack of interest on the part of some settlers due to simultaneous launching of Project activities, and the difficult nature of the Project area, the implementation performance was impeded by the inability of the Government to accord usufruct rights and long lease agreements. The</p>	(i)	The Government to undertake homestead development and miscellaneous (roadside, canal side, etc.) planting activities within the identified, but not implemented, Project area.	DOF	Commencing FY 1996
	(ii)	Woodlots planting activities in Project area set apart for forestry but not yet tackled as such is to be undertaken under national	DOF	-do-

Background	Actions To Be Taken	Agency	Time Frame
<p>successful launching of the Participatory Forestry Program (PFP) by DOF provides legal, administrative, and institutional framework for the completion of uncompleted component activities, particularly relating to woodlots program. Field visit indicated that the upkeep, including supervision by DOF, is inadequate.</p>	<p>PFP based on an assessment of the relevant land and subject to the condition that the settlers meet the conceptual framework of DOF.</p>	DOF	Immediate
<p><b>N. Irrigation Service Fee</b></p>	<p>Under a specific covenant to the Loan Agreements, the Government was required to impose an irrigation service fee (ISF) not later than September 1987. This was not done as it was superseded by covenants under the Agriculture Program Loan. As an alternative, the Government is encouraging FOs to take over operations and maintenance of canals and structures below D-canals. Through Irrigation (Amendment) Act No.13 of 1994, the legal framework has been established exempting command areas below D-canal from payment of irrigation rate, empowering FOs to impose and recover the required levy to cover the required O&amp;M costs and ensuring collection in case of default.</p>	IMD	Immediate
<p><b>O. Settlement of Farmers</b></p>	<p>It was envisaged in the design of the Project, and the Government agreed, to provide user rights to the settlers. This has not been implemented. Lack of legal ownership of the land impaired significantly the settlers' motivation to invest in land development.</p>	LCD	By 30 Jun 1995
	<p>(i) The Government to undertake concerted efforts to encourage FOs in the Project area to take over O&amp;M of all feasible below D-canal structures.</p> <p>(ii) Monitor the progress of such taking over on a quarterly basis and submit an annual report on implementation performance to DOI.</p> <p>(iii) The Government, through the assistance of the Office of Divisional Secretaries, to take actions for the levy of irrigation rate under subsection (i) of section 2 of the Irrigation (Amendment) Act of 1994 in cases below D-canal structures, which are not taken over by FOs.</p>	KOPMC/Central Coordination Committee (CCC)	Beginning Jan 1996
		CCC/IMD	Effective FY 1997

Background	Actions To Be Taken	Agency	Time Frame
<p>In the meantime, LCD has issued 3,960 permits (or 80 percent) out of a total 4,924 farm lot allottees. Balance 20 percent is also ready; however, their issuance depends on resolution of their settlement status (being nonresident settlers). Out of total allotments of 4,924 [each allotment covers both homestead and farm lots but those related to new town areas (consisting of commercial plots, low income, and high income housing lots) have single allotments], 1,438 farmlots and 3,820 homestead lots were already surveyed. Survey work was pending in 3,562 farmlots and 2,883 homestead lots.</p>		MOALF/MOFP	By 31 Oct 1995
<p>To facilitate issuance of title deeds (grants) without survey plans but based on extent and a description of the land to be alienated, Parliament approved on 6 Jun 1995 an amendment to the Land Development Ordinance No. 55 of 1994. However, issuance of grants can not be expedited by LCD until the government decision pertaining to collection of development cost from settlers is obtained. It is recalled that under Item 27 of Schedule 6 to ADB Loan Agreement dated 24 Nov 1986 (Loan 794-SRI(SF)), the Government undertook to recover all costs incurred for field allotments including cost associated with the construction of the field canals, the land development works, for assistance in cash and in kind, for housing loans provided under the Project through application of existing land development ordinances and regulations.</p>	<p>(ii) To submit necessary proposal to the Cabinet, keeping in view the characteristics of Project settlers (open) and their income level as well as the covenant requirement under the Loan Agreement referred to.</p> <p>(iii) To complete preparatory measures for issuance of grants based on extent and description of land subject to Government decision on recovery of development cost.</p> <p>(iv) Notice to nonresident settlers to be issued promptly, advising about cancellation.</p> <p>(v) Cancellation process in all relevant cases to be completed.</p>	LCD	By Dec 1996
<p>In consultation with local Parliamentarians, LCD is taking action to cancel allotments to nonresidents by giving them three months notice.</p>		LCD	By 30 Sep 1995
		LCD	By 31 Dec 1995

Background	Actions To Be Taken	Agency	Time Frame
<p>About 37 percent of settlers are facing problems because of inadequate or lack of demarcation of allocated lands. Boundary disputes due to alienation in a vague manner are increasing. With economic activity gaining momentum, especially in the new areas, this may cause a significant problem in the future. It is thus necessary to resolve the problem now to ensure realization of projected benefits.</p>	<p>(vi) To take actions to identify allocated plots which are yet to be fully demarcated and to draw up a plan for completion of such demarcation.</p> <p>(vii) To complete necessary demarcation in all relevant cases.</p>	<p>LCD with the assistance of Divisional Administration</p> <p>As above.</p>	<p>By end 1995</p> <p>By end 1996</p>
<p><b>P. OFC Support Prices</b></p>		MOALF	By 31 Dec 1995
<p>MOALF explained that the current OFC support price mechanism could not be implemented efficiently in the absence of organizational arrangements related to producers, open market policy of the Government, and uncertainty of marketing interventions by the private sector at appropriate time. To overcome this problem, a Task Force consisting of cross-agency participation, significantly different from the departmental approach, has been constituted. The Task Force is looking into demand, production, and marketing arrangements of key OFCs like onions, chilis, and pulses. They have prepared the plan to ensure offake of about 80 percent of produce. The producers, as a group and through FOs, are being given decision-making authority for direct marketing, contracting and transporting of their produce to the market centers. MOALF also explained that while chili and onions could only be imported on its advice at regular level of tariff, the same in respect of pulses can be done anytime at a reduced tariff level. This has impacted on marketing of pulses</p>	<p>(i) To implement the recommendations of the Task Force and to operationalize the procedures and systems with respect to OFC produce.</p> <p>(ii) To monitor the progress of implementation on a quarterly basis and to take remedial measures.</p> <p>(iii) To augment the training program activities of DTC at Weerawila regarding OFC cultivation procedures and practices.</p> <p>(iv) To ensure adequate availability of quality seeds for cultivation of OFCs.</p>	<p>MOALF</p> <p>MOALF</p> <p>MOALF</p> <p>MOALF</p>	<p>Quarterly basis from 1996 yala season</p> <p>By 31 Dec 1995</p> <p>Continuous basis</p>

Background	Actions To Be Taken	Agency	Time Frame
significantly. OFC cultivation also suffered in the past for lack of water, lower prices, political interventions, and unregulated cattle grazing. DTC at Weerawila continues to impart training with regard to OFC production.			
<b>Q. Housing Loans to Settlers</b>			
A well-conceived housing plan was developed under the Project. Housing loans were given in four installments to settlers with the condition of procuring materials just before the first installment is released. Due to water shortage experienced between 1986 to 1992, no continuous cultivation was possible. This caused very poor (only SLRs98,000) repayment against a loan disbursement of SLRs13.4 million. Field interviews with farmers indicate lack of follow-up for loan recovery.	<p>(i) Every effort should be made to recover the loan proceeds since cultivation has been possible for three consecutive <i>maha</i> and <i>yala</i> seasons. An incentive package for field staff of LCD should be considered to expedite loan recovery.</p> <p>(ii) Loan recovery should be tied up with issuance of grants (permanent land titles) to settlers.</p>	LCD	Immediate
		MOALF	By 31 Dec 1995
<b>R. Tractor Loan Recovery</b>			
Recovery of tractor loans has been satisfactory in respect of Bank of Ceylon (BOC) and People's Bank (PB). The same, however, for Regional Rural Development Bank (RRDB) was extremely low with a recovery of 47 percent. NGO (Sarvohya) operating in the Project area has given loans worth SLRs6 million to small farmers with a recovery rate of 91 percent. There is no reason why RRDB could not recover its loans.	The functioning of RRDB and its loan recovery performance need to be reviewed to delineate measures to ensure better recovery performance.	Central Bank of Sri Lanka (CBSL) / Chairman of RRDB, Hambantota	By 31 Dec 1995