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VOLUME I

DEMOCRATIC SOCIALIST REPUBLIC  
OF  
SRI LANKA

MINISTRY OF LANDS, IRRIGATION  
AND  
MAHAWELI DEVELOPMENT

FINAL PROJECT REPORT

EXECUTIVE SUMMARY, REPORT  
AND  
ANNEXURES

SHELADIA ASSOCIATES INC.  
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## ACKNOWLEDGEMENTS

SHELADIA would like to take this opportunity to express our appreciation to a number of individuals and institutions who made major contributions to the unparalleled success of the Irrigation Systems Management Project.

Each project is unique, but SHELADIA believes that the Irrigation Systems Management Project was especially unusual because the goals of the ISM were to develop and enhance the institutional capabilities of the Ministry of Lands, Irrigation and Mahaweli Development -- through a process of participatory planning, implementation and monitoring -- that would result in the:

- o Improvement of the performance of existing major irrigation systems and, at the distributary field level, and to test and demonstrate several new approaches to rehabilitation and management improvements; and
- o Development of effective coordination between GSL agencies responsible for agricultural extension, research and other support services to the farmers to help assure that the improvements in water management are translated into increased agricultural production and farmer income.

The components of this project were complementary and mutually dependent: only when irrigation systems are sustainably managed can they support a robust agricultural economy; a robust agricultural base is necessary for rural peoples to have a vested interest in the preservation and sensible management of their common properties and shared resources.

And, more importantly, only when indigenous knowledge is assessed and respected, and built upon through participatory planning and implementation, can any lasting, meaningful changes in irrigation system management be effected. The purpose of the ISM Project was to encourage and support sustainable livelihoods through sound resource management -- thereby, increasing the quality of life for the inhabitants of the Polonnaruwa, Kurunegala and Ampara Ranges.

As a firm, SHELADIA is dedicated to the principle that development projects should be fashioned to serve human needs and therefore, should be designed in the most practical and simple manner possible, thus meeting the needs of the intended beneficiaries without foregoing technical quality. This is most important in developing countries, where limited resources have to be shared among competing priorities.

Therefore, we would like to thank USAID and the Government of Sri Lanka for the rare opportunity of implementing the Irrigation Systems Management Project -- a project whose basic concepts underscored SHELADIA's philosophy.

With much appreciation for the support given to us throughout the life of the Project, special thanks is given to the following individuals:

Nanda Abeywickrama, Former Secretary to MLIMD  
A. A. Wiletunga, Former Secretary to MLIMD  
D.G. Premachandra, Former Director/IMD and Secretary /MLIMD  
K. Yoganathan, Director of Irrigation  
D. M. Arivaratna, Director/IMD  
Richard Brown, USAID Director  
George Jones, USAID Deputy Director

In every human endeavour, plagued by and continuously subject to excessive high pressure to perform well, there are certain individuals who rise to the occasion and handle every adversity with common sense and good humour. A very special expression of thanks, therefore to Officers of the implementing institutions who supported the SHELADIA team every step of the way:

G. T. Jayawardena, ISMP Project Director  
Jack Pinney, Chief of Water Resources & Engineering /USAID  
Glen Anders, Chief, Agriculture/Natural Resources/USAID  
D. Jenkins, USAID Project Officer  
L. T. Wijesooriya Sr., Deputy Director, ID  
A. Gunasekera, Director, Water Resources/IMD  
S. Ranatunga Deputy Director O&M/IMDQ  
W. Ellawela, Deputy Director MEF/IMD  
U. G. Jayasinghe Government Agent, Polonnaruwa District  
S. Jayasingha, Deputy Director Finance/IMD  
S. Piyadasa, DDI, Polonnaruwa Range  
W. Gamage, DDI, Ampara Range  
S. Balasingam, former DDI, Kurunegala Range  
S. Senathinathan, Former DDI, Ampara Range  
S. Somasiri DDI, Kurunegala Range  
W. Ratnayaka, Deputy Director, Agriculture

To Chuck Leonhardt, who came to Sri Lanka in 1987 as the SHELADIA's O&M Engineer and took over as Chief-of-Party in September of 1990. Thank you for an incredibly good job of leadership -- and for the many hours you spent with our team giving them the benefit of your long experience as a practitioner of irrigation management in Asia.

To Warren Leatham, whose unexpected death left a void within all of us.

To Louis Haley who launched the project.

SHELADIA wants to acknowledge the dedicated efforts of our technical assistance team because their commitment to the basic philosophy of the ISM Project allowed free rein to their creativity and combined experience. They are:

H.B. Bautista, Farmer Organization Specialist  
T.A. Cerdan, O&M Engineer  
S. Ganewatte, Farmer Organization Specialist

D.S.A. Kulasekera, O&M Engineer  
M.A. Perera, Financial Management Specialist  
N.K. Adikaramge, IO Specialist  
S. Samarakoon, Crop Diversification Specialist  
S. Balasingam, O&M Engineer  
P. Periyasamy, MEF Specialist  
S. Seneviratne, Engineering Assistant  
R. Kandiah, Program Assistant  
W. Amarakoon, Engineering Assistant  
H. Roberts, Training Specialist  
D. Weerakoon, Engineering Assistant  
A. Athureliya, Computer Programmer  
K. Vallipuram, Engineering Assistant  
D.M.R.S. Jayampathy, Draftsman  
S.D. Neelawala, Draftsman  
D.V. de S. Malkanthi, Draftsperson  
S.H. Schick, ME&F Specialist  
J. Wilkins-Wells, Farmer Organization Specialist  
Dr. Gary Merkly, Water Management Specialist  
Prof. V. Skogerboe, Water Management Specialist  
Dr. Kenneth Smith, ME&F Specialist  
Dr. John McCallum, Training Specialist  
H. A. Premaratne, Training Specialist

A very special thanks to the SHELADIA support staff, Alfred Hettiaratchi, Colombo Office Manager, D.V. Dhanapala, Polonnaruwa Office Manager, Usha Lourensz, Administrative Assistant, and Feizal Mansoor, former Office Manager for their tremendous ability to "keep the faith" in light of the project's complicated logistics as well as the enormous amount of production work, that by necessity, is required; and,

Last but not least, to all of our Drivers, who spent many long hours on the road between Colombo and Polonnaruwa and never had an accident!

This project, that began and was carried to conclusion based upon a collegial and participatory approach to implementation, has far reaching implications -- not just for Sri Lanka -- but for other countries in Asia.

Audrey Lutz  
Vice President  
Sheladia Associates, Inc.  
Colombo, Sri Lanka

FINAL REPORT  
IRRIGATION SYSTEMS MANAGEMENT PROJECT  
USAID PROJECT NO 383-0088

CONTENTS

VOLUME I

BASIC PROJECT DATA

LIST OF ACRONYMS

EXECUTIVE SUMMARY

1

PROJECT HISTORY  
PROJECT GOAL  
PROJECT PURPOSE  
PROJECT OBJECTIVES  
CONTRACT OBJECTIVES  
ROLE OF THE CONTRACTOR  
PLANNED END-OF-PROJECT STATUS (EOPS)  
PROJECT COMPONENT  
PROJECT SITES  
PROJECT TECHNICAL ASSISTANCE  
PROJECT COST  
PROJECT ACCOMPLISHMENTS  
MAJOR PROJECT DECISIONS  
PROJECT SUCCESS AND SHORTCOMING  
LESSONS LEARNED FROM PROJECT  
PROJECT SUSTAINABILITY REQUIREMENTS  
CONCLUSIONS  
RECOMMENDATIONS

I.	PROJECT DESIGNS	32
	PROJECT OBJECTIVES	32
	SCOPE OF WORK AND TECHNICAL ASSISTANCE PROVIDED	38
	IMPLEMENTING AGENCIES INVOLVED	49
	PROJECT IMPLEMENTATION STRATEGIES	50
II	PROJECT IMPLEMENTATION OVERVIEW BY COMPONENTS	56
	FARMER ORGANIZATION DEVELOPMENT	56
	ACCOMPLISHMENTS	56
	INNOVATIVE STRATEGIES ADAPTED	57
	SUCCESSSES AND SHORTCOMINGS	58
	STATUS OF FO DEVELOPMENT AT PACD	59



III	MAJOR PROJECT DECISIONS AND EVENTS	102
	GOSL ALLOWS FO TO UNDERTAKE CONSTRUCTION CONTRACTS	102
	USAID ASSESSMENT REPORT - 14 OCTOBER 1988	102
	ISPAN PROJECT REVIEW WORKSHOP - APRIL 6-10 1989	104
	MID-TERM EVALUATION - JULY 1990	106
	GOSLs GRANTING OF LEGAL RECOGNITION TO FOs	107
	GOSL DECISION TO HAND-OVER DISTRIBUTARY CANALS TO FOs	108
	USAID DECISION TO END PROJECT ON PACD	108
	USAID DECISION TO IMPLEMENT IRRIGATION	109
	SECTOR ASSISTANCE AGREEMENT	
IV	POSITIVE AND NEGATIVE FACTORS PROJECT IMPLEMENTATION	110
	GENERAL	110
	FARMER ORGANIZATION DEVELOPMENT	111
	OPERATIONS & MAINTENANCE IMPROVEMENTS	111
	MONITORING, EVALUATION AND FEEDBACK	112
	TRAINING	112
	CROP DIVERSIFICATION	112
	PROCUREMENT	113
	RESEARCH	113
V	LESSONS LEARNED AND CONCLUSIONS	114
	LESSONS LEARNED	114
	FARMER ORGANIZATION DEVELOPMENT	114
	O&M IMPROVEMENTS	114
	CONCLUSIONS	116
	SUSTAINABILITY	116
	EFFECTIVENESS	117
	RELEVANCE	118
	EFFICIENCY	118
	IMPACT	119
VI	PROJECT SUSTAINABILITY REQUIREMENTS	120
	PURPOSE & OBJECTIVES OF FOLLOW ON ACTIVITY	120
	STRATEGIES	120
VII	RECOMMENDATIONS	123
	GENERAL	123
	FARMER ORGANIZATION DEVELOPMENT	124
	OPERATIONS & MAINTENANCE IMPROVEMENTS	125
	FINANCIAL MANAGEMENT IMPROVEMENT	127
	MONITORING, EVALUATION AND FEEDBACK	128
	TRAINING	128
	CROP DIVERSIFICATION	129
	PROCUREMENT	130
	RESEARCH	130
	GAL OYA LEFT BANK AND RIGHT BANK	130

ANNEX	I	SHELADIA'S SCOPE OF WORK
ANNEX	II	LIST OF REPORTS PROVIDED BY SHELADIA UNDER ISMP
ANNEX	III	LIST OF DRAWINGS/MAPS/CHARTS, ETC, PREPARED BY SHELADIA UNDER ISMP
ANNEX	IV	LIFE OF PROJECT PROGRESS SCHEDULE
ANNEX	V	LIST OF VIP VISITORS TO PROJECT
ANNEX	VI	WORKSHOPS ATTENDED OVER LIFE OF PROJECT
ANNEX	VII	DIRECTIVE ON HAND-OVER OF DISTRIBUTORY CHANNELS BY IRRIGATION DEPARTMENT
ANNEX	VIII	DISPOSITION OF NON-EXPENDABLE EQUIPMENT
ANNEX	IX	SELECTED MEF PROGRAM FOR ISMP
ANNEX	X	ISMP PHOTOS

VOLUME II - WORK PLANS

ANNUAL WORK PLAN REPORTS -- 1987 - 1992

I	LIFE-OF-PROJECT WORK PLAN 1987 - 1992
II	ANNUAL WORK PLAN - 1988
III	ANNUAL WORK PLAN - 1989
IV	ANNUAL WORK PLAN - 1990
V	ANNUAL WORK PLAN - 1991
VI	ANNUAL WORK PLAN - 1992

BASIC PROJECT DATA

Title:

Sri Lanka Irrigation Systems Management Project

Sheladia Associates Contract No:

383-0088-C-00-7035-00

Contract Amount:

\$ 4,829,411

Project Cost (Obligated):

Grant Amount	\$	6.9 million
Loan Amount	\$	11.7 million

Project Dates:

First Project Agreement	FY	25 August 1986
Final Obligation	FY	1987
Project Assistance		
Completion Date (PACD)		30 June 1992

Amount of Authorized Project Funding:

Loan	\$	11.7 million
Development Assistance	\$	18.6 million
ESF Grant	\$	0.0
GOSL	\$	. 9,700

Other Donors:

none

USAID Project Officer:

J. Daniel Jenkins  
Mohamed Fallii

Authorized Representative of GOSL:

G.T. Jayawardena

Name of Implementing Agency:

Irrigation Management Division and Irrigation Department of  
the Ministry of Lands, Irrigation and Mahaweli Development

## LIST OF ACRONYMS AND ABBREVIATIONS

ADA (TT)	Assistant Director of Agriculture (Technology
ADB	Asian Development Bank
Addl. G.A	Additional Government Agent
Addl. IE	Additional Irrigation Engineer
ADRC	Associated Development Research Consultants
AICS	Agricultural Industry Consultancy and Service Ltd (Transfer)
AID	Agency for International Development
ARTI	Agrarian Research and Training Institute
BC	Branch Canal
BOP	Blocking Out Plan
CASOM	Computer Assisted Systems Operation Model
CAS	COMMISSIONER OF AGRARIAN SERVICES
cfs	cubic foot per second
CIO	Community Institutional Organizer
COP	Chief-of-Party
CSU	Colorado State University
CTF	Cut-Throat Flume
CWM	Command Water Management
DA	Diagnostic Analysis
DA	Divisional Assistant
DAC	District Agricultural Committee
DAI	Development Alternatives Inc.
D Channel/DC	Distributory Channel (3-50 cfs)
DCO	Distributory Canal Organization
DCFO	Distributory Canal Farmer Organization
DCOC	Division Computer Operations Center
DDI	Deputy Director, Irrigation Department
DDTT	DD (TT) Deputy Director Technology Transfer
DOA	Department of Agriculture
EA	Engineering Assistant
ECL	Engineering Consultant Ltd.
EOPS	End-of-Project Status
ESI	Essential Structural Improvement
FAR	Fixed Amount Reimbursement
F Channel/FC	Field channel (less than 3 cfs)
FCG	Field Canal Group
FCR	Field Canal Representative
FM	Financial Management
FO	Farmer Organization
FOS	Farmer Organization Specialist
FOU	Field Operations Unit
GA	Government Agent
GITI	Galgamuwa Irrigation Training Institute
GOLB	Gal Oya Left Bank

GORB	Gal Oya Right Bank
GSL/GOSL	Government of Sri Lanka
HC	Host Country
HO	Home Office
HVC	High Value Crop
ID	Irrigation Department
IDO	Institutional Development Organizer
IDS	Institutional Development Specialist
IE	Irrigation Engineer
IFB	Invitation for Bid
IIMI	International Irrigation Management Institute
IMD	Irrigation Management Division
INMAS	Integrated Management of Major Irrigation Schemes
IO	Institutional Organizer
IOP	Institutional Organizer Probationer
IRR	Internal Rate of Return
ISMP	Irrigation Systems Management Project
ISPAN	Irrigation Support Project for Asia/Near Asia
LB	Left Bank
LBMC	Left Bank Main Canal
LHC	Low Humie Clay
LHI	Lanka Hydraulic Institute
LOP	Life of Project
Maha	Principal rainy and cultivation season (October-March)
MARD	Mahaweli Agriculture and Rural Development Project
MC	Main Canal
MDS	Mahaweli Downstream Support Project
MEF/ME&F	Monitoring, Evaluation and Feedback
MLIMD	Ministry of Lands, irrigation and Mahaweli Development
OFC	Other Field Crops
O&M	Operations and Maintenance
PA	Program Assistant
PACD	Project Assistance Completion Date
PC	Project Committee
PIL	Project Implementation Letter
PM	Project Manager
PMC	Project Management Committee
PP	Project Paper
PR	Priority Rehabilitation
PSA	Procurement Services Agent
PSC	Personal Services Contract
PSS	(Polonnaruwa) Parakrama Samudra Scheme
RB	Right Bank
RBE	Ridi Bendi Ela
RBES	Reddish Brown Earth Soils
RBMC	Right Bank Main Canal

RCOC Rs.	Range Computer Operations Center Sri Lanka Rupee
SAI	Sheladia Associates Inc.
SLFO	System Level Farmer Organization
SLIDA	Sri Lanka Institute of Development Administration
SPC	Sub Project Committee
SWMC	Scheme Water Management Cell
SWMCOC	Scheme Water Management Cell Organization Chart
SWMOC	Scheme Water Management Operations Chart
TA	Technical Assistant
TAT	Technical Assistance Team
TEAMS	Consultants in Technology, Management and Development Studies
TNA	Training Needs Assessment
TO	Turnout
TOT	Training of Trainers
US	United States
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USU	Utah State University
WB	World Bank
WM	Water Management
WMM	Water Management Model (Short for CASOM)
WMS II	Water Management Synthesis II Project
WS	Work Supervisor (Irrigation Department)
Yala	Second rainy and cultivation season (April - September)

## EXECUTIVE SUMMARY

### PROJECT HISTORY

The Irrigation Systems Management Project (ISMP) constituted the second phase of USAID assistance for improving water management on Major Irrigation Schemes, in Sri Lanka. The first phase of this program was completed with the Gal Oya Water Management Project which was implemented from 1979 - 1985.

The ISM Project Agreement between GSL and USAID was signed on August 25, 1986 with the Project Assistance Completion Date (PACD) on 30 June 1992. The total Project Cost was \$ 28.3 Million of which \$ 9.7 million is a GSL Contribution and \$ 18.6 Million the USAID contribution (a \$ 6.9 million Grant and \$ 11.7 million Loan).

The Technical Assistance (TA) Team was mobilized to Sri Lanka in August, 1987. Project work was initiated by the IMD/ID in late 1986 and early 1987 on the four Irrigation Schemes in the Polonnaruwa Range namely, Parkaramam Samudra, Minneriya, Giritale and Kaudulla Schemes.

### PROJECT GOAL

The goal of the Irrigation Systems Management Project (ISMP) was to expand food and agricultural production, increase rural employment opportunities, and raise net farm income and the standard of living of farmers with existing small land holdings in Sri Lanka. The degree to which this goal was achieved will be measured by intensive sampling of crop yields and farm incomes in the seven ISMP Schemes after the Project PACD.

### PROJECT PURPOSE

The ISMP general purpose was to develop a national institutional capability to increase food production from existing irrigated land. The specific purpose of ISMP was to develop the necessary infrastructure to: (a) support Operation and Maintenance of the Major Irrigation Systems on a sustained renewal basis, i.e, without recourse to periodic major rehabilitation; (b) improved responsiveness to agricultural needs in order to sustain long-term continued increases in agricultural productivity; and (c) test and demonstrate the effectiveness of different combinations of management and structural improvements carried out in various selected Major Irrigation Schemes.

### PROJECT OBJECTIVES

The major ISMP project objectives were:

- (a) develop and strengthen capabilities within Farmers Organizations to assume responsibility for operations and maintenance (O&M);

(b) enhance the O&M capabilities of the Irrigation Department (ID) staff in the Ministry of Lands, Irrigation and Mahaweli Development (MLIMD);

(c) support the Program for Integrated Management of Major Agricultural Settlements (INMAS) under the Irrigation Management Division (IMD) of MLIMD;

(d) institutionalize the training capabilities of the Agencies involved in supporting Farmers' Organizations (DCFOs) by improving O&M and Project Management skills; and

(e) document the lessons learned for application to other irrigation schemes in Sri Lanka and assist with special references to the policy implications that should be considered for adoption in order to facilitate technology transfer.

#### CONTRACT OBJECTIVES:

According to the USAID/Sheladia Contract, the Technical Assistance objectives were to:

Provide technical assistance and related commodity procurement to assist the Government of Sri Lanka in attaining the objectives of the Irrigation Systems Management Project. The Contractor was to provide such technical, advisory, management, engineering, training, procurement and other relevant services required for this purpose.

The ISM Project was to work with the Irrigation Management Division (IMD) and the Irrigation Department (ID) of the Ministry of Lands, Irrigation and Mahaweli Development (MLIM/D), and with other departments and agencies of the Government of Sri Lanka (GOSL), to carry out the second phase of a coordinated water management improvement program begun in 1979 under USAID's Water Management Project. Assistance was to be provided through the ISM Project, at the national level to upgrade MLIM/D institutional capacities to improve the performance of existing major irrigation systems and, at the field level, to test and demonstrate several new approaches to rehabilitation and management improvements. At the same time, coordination was to be sought with GSL agencies responsible for agricultural extension, research and other support services to help assure that the improvement in water management are translated into increased agricultural production.

During the five year life of the project the Contractor was to provide approximately 208 person-months of long and short term local and expatriate professional services. In carrying out the scope of work it was envisaged that Contractor would utilize local expertise. It was estimated that approximately 108 person-months of Sri Lanka professionals' services would be required to effectively carry out the required tasks.

The Technical Assistance provided under the contract was expected to play a key role in the project meeting its objectives. The TA package was designed to build upon existing GSL resources to provide expertise particularly in areas where qualified GSL staff were not available or where new technologies or concepts were being introduced. The success of the institution building process depended heavily on the counterpart relationships developed. While the TA inputs were deemed important, the collaborative relationships to be developed between the TA team and the GSL project staff were considered more important. A key element of this relationship was the training role to be played by the TA team.

The expertise of the TA was to be transferred to the GSL officers through training. This training would vary from a one-one activity to formal group sessions. The TA staff was to actively develop their training role, planning and seeking out proper avenues for the transfer of knowledge.

In addition to the transfer of knowledge, the TA was also to play a role in introducing, discussing, recommending and following up with project staff on policy matters related to the project: document the project progress, through monthly, quarterly and special reports; procure commodities; and in inspecting and certifying construction work for which reimbursement would be requested from AID.

#### ROLE OF THE CONTRACTOR

The Contractor was to:

- (a) Establish the organizational capacity to carry out the contract under the supervision of a resident Chief of Party in Sri Lanka, supported by the Contractor's Home Office.
- (b) Provide technical assistance to develop the institutional capacity of the Ministry of Lands, Irrigation and Mahaweli Development, (MLIM/D), particularly the Irrigation Management Division (IMD) and the Irrigation Department (ID), in support of the objectives of the project.
- (c) Produce specific documents under each of the project components and take other administrative actions upon the request of MLIM/D.

#### END-OF-PROJECT STATUS (EOPS)

At the end of the five years, the integrated program elements for Irrigation Systems Management were expected to result in the following conditions:

- o Institutional capabilities of IMD to create DCFOs, incorporating improved Financial Management (FM) practices, and conducting Monitoring Evaluation and Feedback (ME&F)

activities were effectively developed.

- o Institutional capabilities of the ID to plan, design, manage, implement, operate and maintain the irrigation systems were effectively developed.
- o Communication and coordination between Farmers Organizations (DCFOs), Irrigation Management Division (IMD) and Irrigation Department (ID) personnel will be significantly better.
- o Improved methodologies for creating and strengthening DCFOs will have been developed.
- o Improved Operations and Maintenance (O&M) procedures will be incorporated into the standard operating procedures of the ID.
- o Farmers participatory management of the Irrigation Schemes will be enhanced by the take-over of the Operation and Maintenance of the Distributary Canal System by the DCFOs. This will create DCFO sense of ownership in perpetuating the sustained renewal of the Irrigation Scheme. The introduction of the Computer Assisted Systems Operation Model will enhance a more effective water management program which will ascertain long term increases in agricultural production.
- o Annual Maintenance Plans will have been prepared for the Main Irrigation Systems of each Scheme to be operated and maintained by the ID. Annual Maintenance Plans will have been prepared for all of the Distributary Canal Systems in each Scheme to be operated and maintained by the DCFOs.
- o A Preventative Maintenance Program will have been developed and initiated for all Schemes in the Project and the ID Maintenance Manual up-dated to include this Program.
- o The Monitoring, Evaluation and Feedback (ME&F) Program will be strengthened in ISMP, and replicated in other INMAS Irrigation Schemes with regularized seasonal and annual reporting of important performance indicators.
- o The training capability will be strengthened for: the Galgamuwa Irrigation Training Institute (GITI) for O&M training; the Agrarian Research and Training Institute (ARTI) for training the Institutional Organizers (IOS) who assist farmers in creating DCFOs and undertake research on FO methodologies; for the in-country training of IMD, ID and DCFO members in all phases of O&M and participatory management; and for management and technical, formal and practical training in the USA and other Asian countries.
- o MEF data analysis and research studies will stimulate GSL officials to evaluate strategies for improving irrigated agriculture.
- o Gal Oya Left Bank Canal System will be maintained in a

sustained condition after the Preventative Maintenance Program is implemented and capable of supporting a new program of improved farm management practices and diversified agricultural production during the life-of-project, and afterwards.

- o Pragmatic Rehabilitation (PR) of the Gal Oya Right Bank Canal System and Essential Structural Improvements (ESI) at the four Polonnaruwa District Schemes makes them highly suitable sites for a new program of improved farm water management practices and diversified agriculture production.
- o The structural improvements to be provided in the ISMP Schemes will improve water management at the field canal level which will facilitate better irrigation control for increasing the production of Diversified Crops.

#### PROJECT COMPONENTS

ISMP originally consisted of seven Major Project Components. They were:

- (1) Farmer Organization Development;
- (2) O&M Improvements;
- (3) Financial Management Improvements;
- (4) Monitoring, Evaluation and Feedback;
- (5) Training Capacity Enhancement;
- (6) Research;
- (7) Commodity Procurement; and
- (8) Crop Diversification, which was added during the second year.

#### PROJECT SITES

The Irrigation Schemes included in the implementation of ISMP consisted of Parakrama Samudra, Giritale, Minneriya, Attaragallewa, and Kaudulla Schemes in the Polonnaruwa District, the Right Bank and Left Bank of the Gal Oya in the Ampara District and the Ridi Bendi Ela Scheme in the Kurunegala District. The total extent covered - - including additional encroachment acreage - - was approximately 174,550 acres. A map showing the location of the above seven Irrigation Scheme in the Project follows as Exhibit S-1.

#### PROJECT TECHNICAL ASSISTANCE

Sheladia Associates, Inc. (Sheladia), was selected in 1987 to provide Technical Assistance to the ISMP. A summary of the Technical Assistance provided from 1987 to PACD on 30 June 1992 is presented on Table S-1 below:

TABLE S-1  
ISMP TECHNICAL ASSISTANCE PROVIDED

<u>Category of Personnel</u>	<u>Person-Months</u>
Long-Term Professional (Expatriate)	148.84
Short-Term Professional (Expatriate)	31.19
Home Office Management (Expatriate)	4.90
Technical/Procurement (Expatriate)	15.15
Home Office Administration (Expatriate)	27.80
Long-Term Professional (Local)	316.30
Short-Term Professional (Local)	17.78
Long-Term Administrative (Local)	504.56
Short-Term Administrative (Local)	15.17
Sub-Contract Professional (Expatriate)	24.30
Sub-Contract Professional (Local)	53.30
<b>Total Person Months Over LOP</b>	<b>1159.31</b>

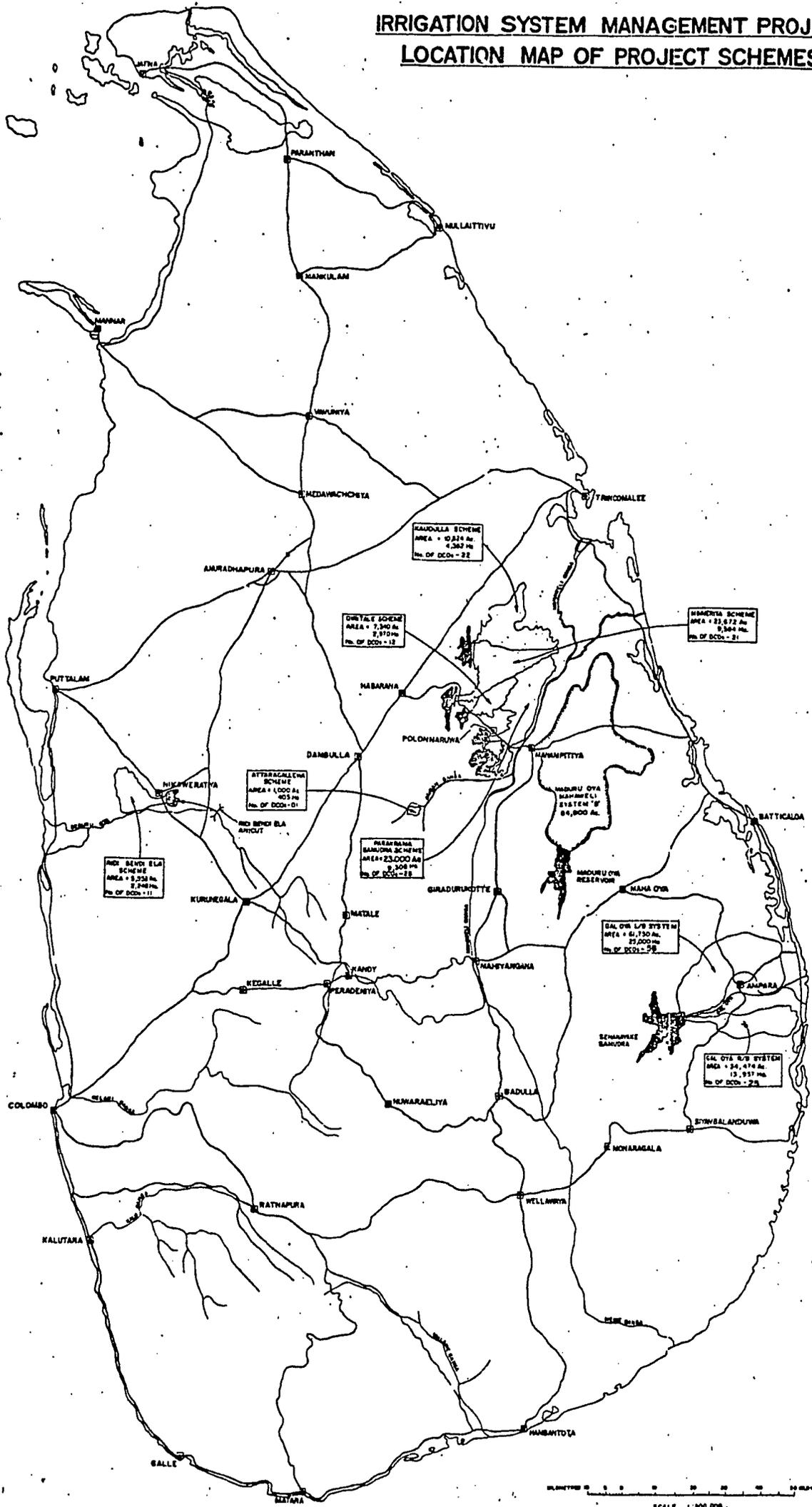
**PROJECT COSTS**

Estimated Project Cost and Final Project Expenditures as of 30 June 1992 (PACD) is shown in Table S-2 below:

TABLE S-2  
IRRIGATION SYSTEMS MANAGEMENT PROJECT  
FINAL COST AS OF 30 JUNE 1992

	Total Cost Estimate		Expenditure up to 30 June 1992	
	U.S. \$	S.L. Rs.	U.S. \$	S.L. Rs.
USAID Grant	6,900,000	186,200,000	6,041,000	249,275,560
Loan	11,700,000	315,900,000	2,826,000	111,114,010
<b>Sub-Total</b>	<b>18,600,000</b>	<b>502,100,000</b>	<b>8,867,000</b>	<b>360,389,570</b>
GOSL	9,700,000	262,000,000	8,867,000	549,637,570
<b>Total</b>	<b>28,300,000</b>	<b>764,100,000</b>		
	U.S. \$ 1 = Rs. 27.00		U.S. \$ 1 Varies from Rs. 28.00 to Rs. 42.50	

# IRRIGATION SYSTEM MANAGEMENT PROJECT LOCATION MAP OF PROJECT SCHEMES



SCALE 1:500,000

60

## PROJECT ACCOMPLISHMENTS

### Farmer Organization Development

During the Project, as expected from the Project Paper, some major accomplishments were achieved under the Farmer Organization Development Program; these accomplishments were:

- o Two Thousand One Hundred and Sixty-Eight (2168) Field Canal Groups were formed in Parakrama Samudra, Giritale, Minneriya, Attaragallewa, Kaudulla, Ridi Bendi Ela and Gal Oya LB and RB Schemes. Each Field Canal has their own representative and he represents the DCFO.
- o One Hundred and Eighty (180) DCFOs were formed in the eight Schemes including Attaragallewa Scheme under Bakamuna Division. The DCFOs were accepted as a formal organization. Their Executive Committee or Board of Management is comprised of Field Canal Representatives and meets monthly.
- o All Field Canal Representatives participate in an Assembly of DCFOs and there they elect the executives of the System Level Farmer Organization. The System Level Farmer Organization is the apex organization in the Scheme and elected Field Canal Representatives are working as Directors of the Board. Six System Level Farmer Organizations have been formed in Parakrama Samudra, Giritale, Minneriya, Kaudulla, RBE and Gal Oya LB Schemes.
- o The Farmer Organizations obtained the legal recognition under the Agrarian Services (Amendment) Act No. 4 of 1991 and 138 DCFOs have registered with the Commissioner of Agrarian Services Department as of PACD. Registration under this Act allowed each of them to become legal entities.
- o 152 DCFOs are actively engaged in the joint management process and are actively engaged in participatory management as evidenced by their take over of the operations and maintenance responsibilities of the Distributary Canal Systems.
- o Recognizing the progress made by the DCFOs in previous construction contracts, the Agencies involved increased their contract value limit to DCFOs from Rs. 25,000 to Rs. 250,000 and finally increased it to Rs. 750,000.
- o Some 150 DCFOs have opened bank accounts in the State Banks and in the Cooperative Rural Bank in order to maintain their Development Funds. The DCFOs utilize this money in supplying agro-inputs to their members and for purchasing of agro-produce from the farmers. In addition to that they provide some funds for O&M of the system in accordance to the requirements of the Annual Maintenance Plan. This is especially true in DCFOs that signed the Standard Memorandum of Undertaking in Management Take Over with the Irrigation Department.

- o Twenty-two (22) DCFOs of Kaudulla Scheme have obtained bank credit from the Regional Rural Development Bank to purchase agro-chemicals and fertilizer to distribute among the members of the DCFO in 1991 Maha season.
- o Seventeen DCFOs were engaged in marketing activities in Minneriya, Kaudulla and Ridi Bendi Ela Schemes during the 1991/92 Maha season and they maintained the guaranteed price all over the ISMP areas.
- o Five DCFOs are eligible to establish paddy mills in Kaudulla and Minneriya Schemes in July 1992. The loans have been approved by the National Development Bank and legal documents have to be sign before 30th June 1992.
- o **Irrigation Sector Assistance Agreement**

The major accomplishments under this agreement are summarized by component below:

To enhance the development of Distributary Canal Farmer Organization (DCFOs) and facilitate their participation in the operation and maintenance of tertiary systems, USAID and the GOSL agreed to implement a Revised Project Approach (RPA) through the Irrigation Sector Assistance Agreement. The most important feature of this Agreement was the release of US\$ 7.0 million to the GOSL in the following three tranche, which are outlined below. Each of these tranche were implemented by PACD.

The First Tranche of \$ 3.0 million was released in September, 1991 after GOSL submitted to USAID the following:

- Draft Standard Memorandum of Understanding to be signed by representatives of FOs, IMD and ID;
- Rights and responsibilities of each party after the turn over of the Distributary Canal System; and
- Criteria and score card which will be used to determine whether a DCFO has reached a sufficient level of competency to be a party to the Agreement

Conditions for receiving the Second Tranche of \$ 2.0 million were satisfied in February, 1992 after a total of 36 DCFOs met the standard criteria and 36 agreed to operate and maintain their respective tertiary systems and formed Water Management Cells.

The Third Tranche of another \$ 2.0 million was released in June, 1992 after another 10 highly qualified DCFOs accepted the responsibilities to operate and maintain their respective Distributary Canal Systems and two Water Management cells in Giritale and Kaudulla Schemes were found to be in full operation.

## Operations and Maintenance

- o A total of 190 Sub-Projects were rehabilitated during the LOP involving some 2,249 km. of Canals and a reimbursable amount of about Rs. 133 million. Of this amount approximately Rs. 97 million has been reimbursed leaving a balance of about Rs. 36 million.
- o Water Management Cells and Field Operation Unit Cells were established in all Seven Schemes within the ISMP area. Farmers participating in Scheme Management by taking over the operation and maintenance of the Distributary Canal System was a major achievement. Introduction of the Computer Assisted System Operation Model for a more effective and efficient water management occurred over LOP to help increase agricultural production.
- o Annual Maintenance and Preventative Maintenance Programs were developed for the Main Systems of all the seven Schemes and for 92 of the 201 DCFOs within the ISMP, in order to achieve the goal of sustained renewal of the Irrigation Systems.

## Financial Management

- o Assistance provided to DCFOs to levy membership fees from the members instead of O&M fees.
- o Assistance provided to IMD in introducing a simple FM system to the DCFOs.
- o Assistance provided to the DCFOs to create Development Funds and utilize that money for supplying of agro-inputs and to buy materials for construction work.
- o At PAUD, a total of 125 DCFOs have a balance of Rs. 2,465,315 in the local Banks as a result of their Development Funds.
- o Training provided to FM Assistants, Institutional Organizers and FC Representatives in Financial Management to improve their skills in managing DCFO funds.
- o 155 DCFOs have opened bank accounts.
- o Training in the preparation of annual budgets was introduced to the DCFOs to strengthen their skills in fund management.
- o 22 DCFOs obtained credit facilities to buy Fertilizers and Agro-Chemicals.
- o DCFOs maintained Address Records and Specification Registers of their own.
- o Seventeen (17) DCFOs engaged in marketing of agricultural produce in concurrence with the Regional Rural Development Bank.

- o DCFOs hired knowledgeable accountants to audit their Book of Accounts and funds in the bank on a regular basis.

#### Monitoring, Evaluation and Feedback

- o A sustainable MEF program has been established in all the schemes of the ISMP and has been in operation since February 1991. The system has already been replicated in other Schemes under the INMAS program.
- o Three reports are produced under the ISMP MEF System. They are:
  1. Annual/Seasonal Planning Reports to establish targets and schedules of various programs;
  2. Management Information System (MIS) report for monthly monitoring and feedback; and
  3. Seasonal Post-Harvest Survey Report to evaluate performance periodically
- o Although the monthly MIS report is prepared on a scheme-wide basis for Irrigation Engineers, Project Managers and District and Headquarters managers, a monitoring system for each DCFO is now utilized at the scheme level to evaluate performance of all DCFOs under each Scheme.

#### Training

- o Developed the capabilities of a cadre of trainers for the Organizations involved in Irrigated Agriculture.
- o Provided validated Training Modules and Manuals in Operations, Maintenance and Financial Management.
- o Created attitudinal changes of officials and farmers. These changed reinforced Participatory Irrigation Systems Management.
- o Upgraded the capabilities of the System Management personnel and farmers.
- o Provided training to Field Canal Representatives in Operation and Maintenance practices and planning Kanna Calendar inputs.
- o Provided technical and practical training through a work/study program to ID staff in Water Measurement practices and techniques and in the use of the Computer Assisted Water Management Model to assure the provide a better means for the equitable distribution of water to the farmers.

## Crop Diversification

- o Recognition and financial assistance extended to the Crop Diversification Program under the ISMP, facilitated the accomplishment of training, field demonstrations and field tours. This was responsible for initiating a major change in the farmer's attitude towards rice mono-cropping.
- o Farmers have realized, through project demonstration and production activities, that net income and employment opportunities that are generated in other field crop production is greater than from rice in spite of the high cost of production.
- o There is a trend of acceptance in all of the schemes under ISMP to increase OFC production, due to the accomplishments on Other Field Crops (OFC) during the LOP.
- o Production extent of other food crops in well drained paddy lands in the four Polonnaruwa Range Schemes and Ridi Bendi Ela Scheme in Kurunegala Range increased five-fold from 2% to 10% between 1987 and 1991.
- o A major production increase in area of 11% was achieved from 1990 to 1991 alone.
- o The above achievements were a direct result of the Farmer Training activities conducted under the ISMP.

## Research

- o Nine Research Studies were concluded under the ISMP by various private consultants under the sponsorship of IIMI. They are summarized in Table S-3 below:

TABLE S-3  
ISMP RESEARCH STUDIES

No.	<u>Name of Research Report</u>	<u>Organization Responsible</u>	Date
1	Study of Participatory Management Program in Nagadeepa, Mahawewa and Pimburettewa.	ADRC	Oct 1989
	Institution Building under ISMP.	TEAMS	Sep 1990
2	Study of Water Delivery System Plan 1 Flow Measurement.	Lanka Hydraulics Inst. Ltd.	Jun 1990
3	Non-Govt. Organizations as Social Change Agents - A Case Study from Sri Lanka.	ADRC	Dec 1990
4	Manual on Floor Measurement for Drop Structures	Lanka Hydraulics Inst. Ltd.	Jan 1991
5	Study on Management and Cost of Operation and Maintenance of Irrigation systems under ID in Sri Lanka.	TEAMS	Jun 1991
6	Rehabilitation of Irrigation Systems Literature Review.	Dr. T. Abeysekera	Dec 1991
7	Maximizing Profitability of Irrigated Agriculture in Polonnaruwa Scheme.	AICS	Jul 1991
8	Turnover of O&M of D-Canals to FOs in Polonnaruwa District.	TEAMS	Mar 1992
9	Cost-Effective Strategies for Irrigation Modernization for the 1990s.	ECL/ADRC	Jun 1992

## MAJOR PROJECT DECISIONS

During the LOP of the ISMP, there were eight major decisions that affected and or changed the course of project implementation. A summary of these decisions are presented here and in detail in Chapter III of the Report.

### o GOSL allows FOs to Undertake Construction Contracts

A major decision was made by the Director of IMD in 1988 to allow the newly developed Farmer Organizations to under take construction contracts under the ISMP rehabilitation program in the area of their respective Distributary Canal System up to a maximum of Rs. 250,000.00

This decision had a major affect in changing the contract award procedure which were normally given to private contractors by the ID. The results of this decision on the progress of the rehabilitation program were very poor during 1988 and 1989. However, the progress made by DCFOs in rehabilitation of their D and F Canals in 1990, 1991 and 1992 improved considerably. Therefore decision taken in 1988 can now be considered a success in the implementation of the rehabilitation program under the ISMP.

### o USAID Assessment Report - December 1988

USAID made a Status Review of the ISMP in November 1988 to assess the progress on the Project and to identify weaknesses for appropriate corrective actions. Several recommendations made had a great impact in changing the Project implementation procedures which directly improved Project performance; they were:

- It was recommended that Sheladia's COP be posted in Polonnaruwa instead of Colombo to provide leadership to Sheladia's Team and to instill the inter-disciplinary approach to Consultant Team Activities; this was done and improvements to the Consultant's activities were achieved
- It was recommended that the FO Specialists and MEF Specialists be extended to ensure those Programs were to the level that they could be sustained before the departure of these specialists. This was accepted and the Local FO Specialist was extended for 28.4 person months and the Expatriate MEF Specialist extended three months and local MEF Specialist extended another 12 months after the expatriate departed. Furthermore, a short-term MEF Specialist was provided in the last two years of the Project for a three month and another one month assignment to finalize the MEF program.

These extensions and additions of both FO and MEF Consultants had a great effect on the accomplishment of

the FO and MEF Component goals under ISMP.

- One of the Project purposes was to test and demonstrate the effectiveness of different construction management and structural improvements carried out in various selected Major Irrigation Schemes. At the time of the Assessment Report no work had been accomplished on the study. The Assessment Team recommended that the Consultant take on this responsibility under its contract with USAID. Based on the recommendation the Consultant, proceeded with an Economic Cost-Effective Analysis Report outlining the procedures to accomplish this requirement of the Project Paper. Subsequently at the Mid-Term Evaluation, because of the importance of this Study, it was recommended that it be conducted as a Research Study under leadership of IIMI. This recommendation was accepted and the Study was completed by PACD.
- It was recommended that work either be started in Gal Oya by end 1989 or the planned work on the Gal Oya RB and LB be shifted to another Scheme. Based upon this recommendation, the Consultant, s O&M Engineer and FO Specialist and USAID Chief Engineer and ISMP Project Officer made an inspection of the situation in Ampara District in April 1989. Based upon that inspection, it was recommended by Sheladia and USAID that the planned ISMP work on the Gal Oya Project proceed. Work commenced in late 1989 based upon that decision.

o ISPAN Project Review Workshop

A four day workshop was conducted by ISPAN in April 1989 to review the status of ISMP and to identify problems and make appropriate solutions to those problems.

The major decisions made were:

- Farmer Organizations must be legalized
- Training in O&M procedures should be given to Farmer Representatives before take-over of D-Canals
- Earthwork should be paid to farmers in Field Canals above 60 acre service area
- DCFos should be allowed to undertake construction contracts in their Distributary Canal areas up to Rs. 250,000
- Training in FM to MEF/FM Assistance as trainers in FM
- A full time IMD Project Deputy Director be assigned for MEF to implement the MEF Program

- Research is far behind schedule and should be monitored more closely by IIMI to ensure the studies are carried effectively and on schedule.

- o ISPAN Mid-Term Evaluation - July 1990

A Mid-Term Evaluation was made to assess the progress made on the ISMP as of April 1990 and to make recommendations for completing the various Component and achieving Project Objectives before PACD.

The major conclusion made at the Mid-Term Evaluation was that the rehabilitation efforts on the Project could not be achieved by PACD due to wide spread civil unrest and other reasons. Since the ISMP goal of long-term sustainability of the Systems could not be achieved without the completion of the rehabilitation work, the Evaluation Team recommended that the Project be extended for at least two years after the original PACD date of 30 June 1992.

- o GOSL Granting Legal Recognition to FOs

Finally, in early 1991, the Agrarian Service's Act No. 4 (Amended) of 1991 provides the FO legal status to act and assume power of a Corporate Body. This was a major turning point in the development of the FOs in Sri Lanka as most of the FOs could now conduct legal business with private enterprises, banks, etc., in order to engage in other income generating activities other than the O&M of their Distributary Canal Systems.

- o GOSL Decision to Hand Over D-Canals to FOs

A major decision was made in January 1989 by the Director of Irrigation to hand-over the responsibility of the Operation and Maintenance of the Distributary Canal Systems (DC and FC) to the Farmer Organizations. This decision resulted in the ID first handing over the maintenance responsibility to the Farmer Organizations and eventually after training of the farmers in operations by the ID staff, the operations were handed over. Officially the first hand-over ceremony was made to some 34 DCFOs on 8 February 1992, another major achievement on the Farmer Organization Development Program under ISMP.

- o USAID's Decision to End Project on Original PACD

USAID decided in September 1989 to terminate the ISMP on the original PACD date of 30 June 1992, in spite of the recommendation made in the Mid-Term Evaluation to extend the Technical Assistance for at least two years. We believe USAID's decision was based on the belief that the Contractor had achieved the TA objectives of upgrading IMD/ID institutional capacities to improve the performance of existing major irrigation systems and, at the field level, to

test and demonstrate several new approaches to rehabilitation and management improvements. In addition, effective coordination has been developed between GSL agencies responsible for agricultural extension, research and other support services to help assure that the improvements in water management are translated into increased agricultural production.

o USAID'S Decision to Implement Irrigation Sector Assistance Agreement

The implementing Agencies are institutionally capable of completing the remaining rehabilitation work and that certain policy and organizational constraints for Farmer Organization strengthening and Water Management need to be in place to assure sustainability and effectiveness. Accordingly, USAID added a performance-based disbursement component to the Project to assure achievement of the critical reforms. The GOSL has formally agreed to budget and complete the remaining canal upgrading and rehabilitation over a three year period after the PACD.

Criteria was developed for implementing the Agreement with GOSL for the Grant turn-over of funds remaining under ISMP at PACD. The terms of this Agreement were stipulated under the criteria established for release of Tranche funds included:

- |                            |   |
|----------------------------|---|
| Tranche 1 (\$ 3.0 million) | Prepare Standard FO Hand-Over Agreement and Prepare FO Evaluation Criteria for Hand-Over  |
| Tranche 2 (\$ 2.0 million) | Hand-Over Distributary Canal Systems to 30 DCFOs and Set-up Water Management Cells in the Seven Schemes of the Project  |
| Tranche 3 (\$ 2.0 million) | Hand over another 10 Distributary Canal Systems to DCFOs and ensure that Water Management Cells in two of seven Schemes are in full operation; and that three SLFO are established and functioning. |

Tranche 1 was completed and funds released in September 1991; Tranche 2 was completed and certified by TA contractor in December 1991 and funds released to GOSL in February 1992, and Tranche 3 was completed and certified by TA contractor by PACD 30 June 1992.

## PROJECT SUCCESSES AND SHORTCOMINGS

ISMP achieved major successes in meeting MOST targets and, more importantly, in its participatory approach. These successes are described below.

### Project Successes

#### o Formation of DCFOs/SLFOs for O&M and Agri-Business Activities

180 DCFOs were formed under this Project made up, on average, of 10-12 Field Canal Groups. SLFOs were formed in six of the seven ISMP Schemes. While the role of the SLFOs is evolving and varies from scheme-to-scheme, in general, the SLFO is the spokesman for the DCFOs with outside agencies and it handles scheme-level and main system concerns. The DCFOs have all received training in the Operation and Maintenance of their Distributary Canal Systems and Financial Management. DCFOs have officially taken over the responsibility from the GOSL. While the majority of these groups still require training and modest technical assistance in order to function, many have been assisted in taking significant steps in serving their membership in areas outside the originally-envisioned area of O&M. Specifically, the DCFOs have become involved in agro-input supply, including seeds and fertilizer; improved water management through the preparation of Crop Production Plans; and processing, storage and marketing. Five DCFOs were recently approved for loans from the National Development Bank for the establishment of DCFO-owned and managed rice mills.

#### o Formation of Women's and Youth Organizations

Started in late 1990, the formation of Women's and Youth Organizations under the purview of the DCFOs was an innovation which served two major purposes. (1) It significantly strengthened a number of the farmer organizations and (2) it provided farm women with the ability to engender a discretionary income. In the areas where they were formed, the women and youth conveyed to the DCFO their enthusiasm for the community activities and income-generating activities in which they are now involved, such as handicrafts, textiles, and the preparation of jams and jellies. The DCFO member-farmers were encouraged by their families to become an effective organization so that these auxiliary groups could continue.

#### o Crop Diversification

Production of different crops were either introduced or expanded in the ISMP schemes through the efforts of the Sheladia Agronomist. Cowpea, mung bean, ground-nuts, soya bean, chillies, onion and gherkins were among the crops promoted for planting on paddy fields. In the Polonnaruwa Schemes, with a command area of 67,500 acres, the percentage of area cultivated to OFC during Yala increased from 1.7% in

1987 to 8.8% in 1990. In the Ridi Bendi Ela Scheme (5,800 acres), the percentage changed from 9.5% to 14.6% over this same period.

Mushroom production was established in Minneriya by training a group of 30 farm women in its cultivation. Dry straw mushrooms keep well and garner a higher price. While to date mushroom spawns have had to be purchased from Colombo, arrangements have been made with the Deputy Director for Technology Transfer to begin a small-scale spawn production in Minneriya.

o Volunteer Farmer Extension Workers

When the Crop Diversification Program began, the Department of Agriculture had a well-trained grass-roots cadre of extensionists. Shortly, thereafter, these personnel were absorbed by other entities and ceased to serve their former role. To address the serious problem of a lack of information and technology flow, the Sheladia Agronomist selected, motivated and trained a group of volunteer farmer extension workers. One was selected from each DCFO and given one-week of training, followed by field-training and provided with "in-service" training in areas such as soil-tillage, land preparation, crop selection, crop establishment, plant protection and small farm machinery. This program began in 1991 and continues as of PACD.

o Beneficiary Participation

ISMP embraced the participatory approach involving farmers and farm families extensively in Project activities. Members of the farmer organizations were supported in the development of their own plans, procedures and regulations. These groups collectively participated in Shramadana activities (volunteer community labour) and other community functions along the side of government officials. Participatory management of Irrigation Schemes was initiated by ISMP through the involvement of the DCFOs in the management of the Schemes. The operation and maintenance of the Distributary Canal System in more than 40 DCFO areas have already been taken over by DCFOs, while the other areas where DCFOs have been formed are being operated and maintained jointly by the Irrigation Department and the DCFOs.

DCFOs were given the status of legal entities and entered into contracts for rehabilitation works in the D-canals they would come to operate, maintain and manage. DCFO participation in these construction works was initially problematic, but eventually rapid progress was made and the limit on contract value was raised by the GOSL from Rs. 25,000 to 50,000, 250,000 and finally 750,000. The participation and involvement of the DCFOs in O&M improvements enhanced their awareness of their responsibilities as beneficiaries of the Irrigation Schemes. It also helped them improve their capabilities in

undertaking contract works on irrigation facilities.

o Introduction of VOCA

Sheladia initiated the involvement in ISMP of a US private voluntary organization known as VOCA--Volunteers in Overseas Cooperative Assistance. VOCA sends highly-skilled volunteers to various developing country sites only at the request of local communities. This organization was invited to visit several of the Women's Organizations in Minneriya to ascertain what could or should be done in the way of specialized training and technical assistance. A select number of Women's Organizations defined their interests and formalized a request. VOCA provided the first volunteer, in what both Sheladia and VOCA expect to be a continued stream of volunteers, in May of 1992.

o Establishment of Development Funds

The collection of O&M fees was obstructed by local political factors early in the Project, ISMP was eventually able to circumvent the problem, in part, through the establishment of the DCFO Development Fund. This Fund has several sources--the DCFO enrolment fee, seasonal membership fees, profits from rehabilitation work contracts, and profits from agri-business activities. The Fund, however, also must serve purposes other than just O&M--e.g., capital requirements for agri-business activities, investments, etc.

o Development of a Practical ME&F System

In spite of initial difficulties, a well-conceived and practical Monitoring, Evaluation and Feedback System was developed and first put in place in early 1991. Training in the collection and analysis of information was conducted at all levels. There was a follow-up review of the program in early 1992, when the ME&F System was refined and further training needs identified.

o Annual Maintenance Plans

The Annual Maintenance Plans and Cost Estimates developed for the Main Systems of the seven ISMP Schemes was a major effort and accomplishment. Nowhere in Asia has a program been developed with such detail and planning. Again, the plans were developed in collaboration with GOSL and the various levels of farmer organizations.

o Establishment of Water Management Cells

Water Management Cells have been set up in all the Schemes within the ISMP. The Plan is already under implementation in the Giritale, Kaudulla, RBE and GOLB Schemes. A TA who will head the Scheme Water Management Cell will also be working full time supervising operations activities in their

respective Schemes. Installation and calibration of measuring devices has been undertaken and patrol labourers have been assigned to gather field data to be fed into the computer model.

o Attainment of Irrigation Sector Assistance Targets

An accelerated program was introduced in the final year of ISMP which called for the GOSL to achieve certain targets, by specific dates, in order to receive designated funds. Sheladia assisted the government in meeting stringent deadlines for, among other things, establishing Water Management Cells and preparing a large number of DCFOs for official take-over of their D-level systems.

Project Shortcomings

o Implementation of the Preventative Maintenance Plans

While relevant detailed PM plans were collaboratively developed in each ISMP Scheme, they have yet to be tested by actual implementation.

PM could not be implemented before the completion of the rehabilitation works. The rehabilitation schedule for ISMP was far too optimistic given that a short construction period (only two months, so as not to disturb cultivation) and the delays caused by civil unrest.

o Collection of O&M Fees

O&M fees are being collected as so-called enrolment and membership fees, but collections are not universal. In some DCFOs, a substantial proportion of farmers are not paying their share. All members must pay their fees or be sanctioned in some manner. Otherwise, the free-rider problem will undermine participants' motivation.

LESSONS LEARNED FROM PROJECT

Farmer Organization Development

The handing-over interviews of DCFO Officers and members of the Board of Directors proved useful in furthering farmers' understanding of the importance of farmer organizations, as well as increasing their production and income. If this evaluation had been introduced earlier in the DCFO's development, the ISMP FO Program would have advanced even more rapidly.

Collection of O&M fees is a sensitive matter. Rather than collecting fees for O&M, per se, ISMP promoted the establishment of DCFO Development Funds which would be used not only for O&M, but as working capital for other income-generating activities. This has been a successful strategy.

Finally, organizing farmers is a difficult task. It takes time, motivation and a set of practical incentives. The farmers have different problems pertaining to water, land and other resources and they cannot be treated as monolithic. In working with the farmers, it is helpful to understand them from a humanistic point of view.

The development and sustainability of Farmer Organizations depend on all water-users becoming members of the DCFOs and the DCFOs in turn must serve the needs of their members. It is essential that a constant dialogue be maintained among DCFO Representatives and the DCFO farmers. Finally, all members must pay their fees or be sanctioned in some manner; otherwise the free-rider problem will undermine participants' motivation.

### Operations and Maintenance Improvements

The participation and involvement of the DCFOs in O&M improvements enhanced awareness of their responsibilities as beneficiaries of the Irrigation Schemes. It also helped them improve their capabilities in undertaking contract works on irrigation facilities.

Some Sub-Projects take three to four years to complete due to existing local conditions and the length of time in preparing designs and estimates which at times extend up to the close season. Contractors did not maintain the works they had completed earlier, therefore the works deteriorate even before they are turned over and reported as completed.

Various types of structures have been constructed within the ISMP area depending on various factors. Rubble packing of scoured outlets of structures and side slopes of big canals are common sights and are still in place. In other areas retaining walls/toe walls have been constructed instead of rubble packing. Toe walls are also constructed on small field canals which appear to be too bulky and inappropriate for small canals. Rubble packing would have been better or even well compacted earthfill would have been sufficient.

Improvements to headgates of turnouts for the installation of screw type sliding steel gates come in different sizes and shapes. It was observed that improvements undertaken on these structures in Gal Oya RB, Ridi Bendi Ela, and some schemes in PSS in Polonnaruwa, are of the correct height and size and are more economical to construct than the others. The more economical ones have been highlighted in the Quarterly Report for the quarter ending September 1991.

Based upon detailed results developed for the twelve DCFOs in the Giritale Scheme the following information regarding the maintenance of the D and F canals to be taken over and maintained by the DCFOs can be stated:

- The average Annual cost Maintenance of the DCFOs in Giritale Scheme was about Rs. 205 per acre.

- Labor requirements of the Maintenance Cost was found to be about 75% or about Rs. 155 per acre.
- Cost of material, equipment, fuel, etc. is only 25% of the Maintenance Cost, or only Rs. 50 per acre.

Based upon the above results it can be concluded that the annual cost needed for the DCFO to maintain their D and F canals is only about Rs. 50 per acre provided the members contribute their labor to the organization in order to implement the Annual Maintenance Plans.

Operation and maintenance are parallel, but separate activities in the Irrigation Schemes. The funds for these activities are usually given as lump sum appropriations. The Annual Maintenance Cost for the Main System have been prepared for most the Schemes within the ISMP area. An Operation Cost Estimate for the Giritale Main and Distributary System was prepared based on the actual needs for sustained operation including the operation of the Division Computer Center. It is expected that the lump sum appropriation provided by the IMD for O&M of Schemes, would now be easier to allocate based on the these estimates for the individual activities and will redound to a more efficient and effective implementation of the O&M program of the respective systems.

During walk-through surveys for planning rehabilitation works, more care should be made in considering which works are to be given priority especially when funds are limited. Canal structures that are about to collapse but could still be saved are easier to repair and provide a better economic return. They must be given priority over those that have already collapsed.

In the selection of the type of canal protection structures to be adapted, the use of the rubble packing against the bulky and more expensive toe walls must be closely studied, especially in areas where the topography is flat and the danger of canal washout is not imminent.

When improving turnout headgates for the installation of screw type steel gates, the smaller structures like the ones constructed in Gal Oya RB, Ridi Bendi Ela and some parts of Parakrama Samudra Schemes should be considered and adopted in the unfinished Sub-Projects and/or in future rehabilitation projects.

Rubble packing should be used to stabilize the canal side slopes at the outlet of drop structures with outlets already being scoured.

Pipe outlets in field canals must not extend beyond the toe of the canal embankment. If the width of the canal bund is sufficient, the pipe outlet should extend only up to the toe of the canal bund.

## PROJECT SUSTAINABILITY REQUIREMENTS

### Purpose and Objectives of Follow-on Activity

The Purpose of future Project activity in the ISMP Schemes is to provide greater sustainability while promoting a gradual and planned transition away from external support. Specifically, the follow-on should seek to continue to increase rural incomes through improved yields, diversified production, and improved water management, while institutionalizing farmer self-reliance in the operation and maintenance of the irrigation systems on a sustained-renewal basis.

The objectives of future Project activity will be to:

1. Strengthen Farmer Organizations through training and experience so that they are financially and institutionally capable of sustained existence and organic growth.
2. Strengthen Farmer Organization capabilities in improved operations and maintenance and management of their Distributary Canal Systems.
3. Promote agri-business and other income-generating activities among the Schemes' farmers.
4. Ensure fuller participation of Women in Development and in the benefits of development.

#### Strategies

A set of strategies to achieve these objectives was developed during the Sheladia Team's Lessons Learned Workshop conducted during the last month of ISMP. These are presented below. Given the extent of current needs, it is proposed that a three-year effort be planned which would provide technical assistance and training on a declining basis.

#### Strategies for GOSL

- o Decentralize GOSL coordination of field activities, but continue to liaise with a National Project Director.
- o Improve periodic inter-agency scheme-level meetings; provide resources for lunch, travel, honoraria; improve management of meetings (minutes, agenda, guest speakers, etc.).
- o IMD should continue to support Crop Diversification activities from internal or PL 480 sources.
- o Use the Irrigation Sector Assistance Fund, in part, for follow-on activities.
- o Appoint IDOs for each major scheme at a frequency of one per 10,000 acres.
- o Make Agricultural Instructors available for Crop

Diversification and Paddy Production at a frequency of one per 10,000 acres.

- o Continue the financing of Financial Management/MEF Assistants as long as needed.
- o Assign one full-time ID official (Technical Assistant level) for O&M at each scheme.
- o Provide the O&M funds required for the Preventative Maintenance and System Operations Programs for the Main Systems as developed during ISMP.
- o ID should implement Preventative Maintenance Program for the Main Systems.
- o ID should implement improved Systems Operation Program.
- o ID should complete the DCFO Annual Maintenance Plans for Gal Oya Right Bank and Left Bank Systems.
- o ID should continue to provide technical support to DCFOs in construction management, quality control, maintenance and operations.

Strategies for Implementors (GOSL, USAID, Contractors, NGOs/PVOs)

- o Strengthen legal status of DCFOs.
- o Develop SLFOs as legal entities.
- o Facilitate DCFO access to credit or grants for start-up capital for such outlays as warehouses, weigh scales, mills, trucks, etc.
- o Maximize utilization of Women's Organizations in income-generating activities.
- o Expand Women's Organizations' participation in DCFO activities, as well as planning and decision-making.
- o Encourage DCFO to hire paid employees for technical and management support. Provide FM/MEF training to these DCFO employees.
- o Provide MEF, Management, Business and Leadership Training for DCFO/SLFO leaders.
- o Spread the burden of DCFO activities through the formation of various Work Committees which would develop and implement plans and monitor and evaluate related activities.
- o Use external PVO/NGO resources, such as VOCA, ACDI, and the Ford Foundation.

- o Use Sri Lankan PVO/NGO resources increasingly, such as those of Janasaviya Trust Fund or Sarvodaya.
- o Facilitate DCFO-financed compensation for Jalapalakas and Field Canal Representatives.
- o Upgrade IO capabilities and retrain as DCFOs' requirements mature.
- o Continue to provide modest material and financial resources to DCFOs and SLFOs on a declining basis with an aim towards establishing them as viable business entities.
- o Focus efforts on identifying priority DCFOs, to be selected based on needs and potential impact of interventions. Provide at least some continued assistance to all DCFOs to provide equitable chance of sustainability.
- o Maximize utilization of existing GOSL channels for implementation.
- o Undertake Training Needs Assessment of DCFOs and SLFOs to assist in targeting limited resources.
- o Progressively develop linkages with Governmental Agencies, NGOs/PVUs and private sector entities.
- o Continue, at an intensified level, awareness-raising among DCFOs of the requirements of privatization (e.g., hiring of managers and IOs, financial management, etc.).
- o Expand crop diversification activities.
- o Continue involvement of DCFOs in decision-making concerning rehabilitation, O&M and system operation.
- o Continue DCFO participation in rehabilitation contracts, and expand to include Distributary-Level work.
- o Ensure transparency in the awarding of contracts and management of DCFO/SLFO funds.
- o Rationalize incentives; do not punish successful DCFOs.

- o Reinforce DCFO/SLFO capability to prepare, implement, monitor and evaluate the following:
  - Seasonal Crop Production Plans
  - Annual Maintenance Plans
  - Annual Budgets
  - Crop Marketing Plans
  - Business Management Plans
  - O&M Plans
  - Preventative Maintenance Plans

## CONCLUSIONS

### Sustainability

#### o Farmer Organization Development

Each of the major components of this Project will require additional assistance in order to fulfil the Project Purpose of improving rural incomes through farmer-managed operation and maintenance of irrigation systems on a sustained-renewal basis. While the TA Team succeeded in organizing almost 180 D-Canal Farmer Organizations, each with an average of 10-12 Field Canal Groups, the capabilities and cohesiveness of these organizations varies greatly. Some organizations have been formed very recently while others have been in existence for some time but are plagued with problems; it is important that IMD/ID continue to support and reinforce their efforts. Further training in Financial Management, Planning, MEF and Business would have a tremendous pay-off given the level of interest and enthusiasm among farmers at this time.

Finally, it must be recognized that, in general, all of the DCFOs and SLFOs are in their infancy, especially with regard to agri-business activity.

#### o Operations and Maintenance

The information and data developed for the Annual Maintenance Plans and related documents, if implemented under the Preventative Maintenance Program after ISMP, should be effective in sustaining the Main Systems provided the maintenance funds in the Annual Maintenance Plans are provided to the ID by the GOSL for each Scheme. So far the funds allocated for maintenance by the GOSL for the four Schemes in the Polonnaruwa Range is only about 40% of that required according to the Annual Maintenance Costs developed for the Main System of these four Schemes. Furthermore, part of that budget allocation for Maintenance was to be used for the D-Canals, so it is even less than 40% of the Main System maintenance required.

Additional funds must be allocated for Main System Maintenance if the ISMP Schemes are to be sustained through the

Preventative Maintenance Program without the need for major rehabilitation in the future.

The Annual Maintenance Plans and Costs developed for the Distributary Systems of 5 of the 7 Schemes (92 out of 201 DCFOs) of the Project was a major accomplishment. The Annual Maintenance Plans should be effective, provided the DCFOs develop the man-power and funds to fully implement the plans for sustaining the systems. To date, these Annual Maintenance Plans have not been implemented by the DCFOs, therefore conclusions as to the effectiveness of the Preventative Maintenance Program at the Distributary Canal Level would be premature.

The Action Plan for the implementation of improved water management in all the ISMP Schemes were developed after discussions and review of past experiences. The Plan is meant to improve the management of the available resources within the Schemes. The implementation of the activities under the plan is easy but requires dedication and perseverance. Operation and Maintenance is not an attractive field, therefore the personnel involved should be properly motivated and compensated. Otherwise they may favour other fields of Engineering. The Irrigation Department has technical personnel who are very capable of undertaking the implementation of the Plan. There are individuals who like to undertake challenges and this is a very challenging activity.

o Effectiveness

The Project achieved its goal in a significant manner. In some instances, goals were exceeded. A major exception was the delayed implementation of the Preventative Maintenance Plans and the overall program in Ampara, due to unrest in the area. The PM program was effective because detailed plans were collaboratively designed. These plans were difficult to implement, given the extremely short construction/maintenance season. Also, PM could not begin until rehabilitation was completed.

The reader is referred to Chapter II of this Report for a detailed review of accomplishments against targets for each Project component.

o Relevance

In some ways, the development constraints the Project was designed to address are no longer relevant to AID's current development strategies. Foremost of these was the Project's objective of developing a mechanism that would allow O&M of selected irrigation systems on a sustained-renewal basis. While AID has apparently retreated from the funding of irrigation rehabilitation projects, several considerations continue to make ISMP strategies relevant, in substance. Some

of the specific strategies used by ISMP to promote rural income generation, technology transfer, and improved resource use, were:

- o Women-in-development
- o Agro-enterprise development
- o Land tenure
- o Beneficiary participation
- o Soil and water conservation
- o Self-financing operations/privatization
- o Crop diversification
- o Public-private partnerships

o Efficiency

It is important to note that the multi-disciplined, participative approach envisioned in the Project Paper and implemented by the TA Team was efficient. Each component offered reinforcement to the others. The enlarged role developed for local professionals provided both a critical mass and an intimate knowledge of local conditions which was cost-effective. In addition, Sheladia believes that the role of local professionals contributed significantly to the Project success. It should also be noted that the costs incurred on this Project were relatively low compared with those of other similar ongoing projects in Sri Lanka.

In hindsight, efficiency would have been improved if the following had been incorporated in the Project design:

- o Awareness by the target groups' of Project objectives and plans was not achieved until the latter half of LOP. Had there been a mass media awareness campaign at the beginning, earlier participation of the targeted farmers would have been achieved and Project objectives enhanced.
- o If there were direct contracts in construction with the farmer organizations, supervised by private sector firms, rehabilitation work could have been accelerated--at the same or lower cost.
- o Local and overseas training would have provided greater benefit to the Project if it had taken place in the first year or two of the Project, or even in a pre-Project phase.

o Impact

While it may be too early to make definitive judgements as to the positive and negative impacts of ISMP, some notable changes have. Positive impacts include:

- o Acceptance by farmers of participatory irrigation system management including an awareness and acceptance of the government's inability to cover O&M costs.

- o Farmers involvement in diversified income-generating and financial management activities.
- o Introduction and acceptance of economical methods of rehabilitation were introduced and adopted (e.g., use of Dry Rubble Packing vs. Toe Walls)
- o Greater equity in the allocation of water, due to training in water management and installation of water measuring devices at headgates and boundaries of DCFOs.
- o Use of the Field Operations Units established by ISMP by ID, IMD, field personnel and farmers.
- o A high level of enthusiasm exists among Farmer Organizations and Women's Organizations, while expectations appear reasonable.

A major potential negative impact that could be envisioned is that an indeterminate number of DCFOs may falter, making it much more difficult for any future effort to get cooperation.

#### RECOMMENDATIONS

The ISMP Team developed a set of recommendations for each component of the Project as well as a set which applies across the components. These recommendations were developed to address the issue of the social, economic, institutional and physical sustainability of ISMP.

Because some of these recommendations are more urgent than others, some are essential and some are more broadly applicable, they have been organized along these dimensions in the body of the report. This Executive Summary presents only selected essential recommendations which, if implemented, will provide substantial benefit and, if ignored, may result in eventual reversion to pre-Project status in one or more of the Project's components.

The majority of these recommendations have applicability beyond the bounds of the ISMP schemes in Sri Lanka; those that do not are followed by "ISMP" or some other delimitation in parentheses. There is also a separate section for recommendations pertaining to the Ampara Range because of the less developed status of its schemes.

The designation of some recommendations as implementable in the Medium-Term does not mean to suggest there would not be an advantage in an early implementation, but simply that they can be delayed for a limited time should resources be presently inadequate to undertake the proposed program in its entirety.

It is hoped that this organization of the recommendations will aid persons continuing the work ISMP started, as well as designers and implementers of similar projects, to set priorities and assess the policy implications of certain strategies for technology transfer and sustainable development. The reader is encouraged to refer to

the Recommendations chapter of this report as well as the Conclusions and Recommendations Sections of the individual team members' End-of-Tour Reports for full elaboration.

### General

Essential Recommendations to be Implemented Urgently:

- 1.\* Improve the awareness among Project participants of the Project's objectives, strategies and approach to implementation.
- 2.\* Complete the outstanding activities programmed for 1992.

### Farmer Organization Development

Essential Recommendations to be Implemented Urgently:

- 1.\* IMD should assign an officer to each of the Districts to coordinate the activities of the Project Managers.
- 2.\* Continue to involve women in agro-processing and other income-generating activities.

### Operations and Maintenance

Essential Recommendations to be Implemented Urgently:

- 1.\* Provide the necessary transport, communication and accommodation facilities to the technical staff.
- 2.\* Impose strict quality control standards for rehabilitation work.
- 3.\* Pay for field canal earthwork under Project funds. Users can still pay for this work, but indirectly. DCFOs should be assessed fees based on average costs of the earthwork. The Project, through ID, should then contract out the work. DCFOs could recoup their fees by undertaking these contracts and thus an incentive would be in place to assure completion of the earthwork which has, without exception, constrained every irrigation project in Sri Lanka.
- 4.\* Utilize rainfall effectively thereby maintaining tank water levels.
- 5.\* The Technical Assistant (TA) of the Field Operations Unit together with the DCFO Water Master must make joint walk-through verification of water needs. (ISMP)
- 6.\* ID must rehabilitate the D-Canal system prior to the turning over to DCFOs.

## Essential Recommendations to be Implemented in the Medium Term:

- 1.\* Revise the present handing-over program for O&M of D-canal systems so that successful DCFOs can be rewarded financially, rather than punished with the withdrawal of support--sometimes before rehabilitation works are complete.

### Financial Management

#### Essential Recommendations to be Implemented Urgently:

- 1.\* Train and monitor officials of DCFOs and SLFOs to assure that they prepare monthly income and expenditure accounts and bank reconciliations.

#### Essential Recommendations to be Implemented in the Medium Term:

- 1.\* Audit the DCFOs and SLFOs and assist them in the preparation of balance sheets and profit/loss statements.
- 2.\* Ensure collection of membership fees by DCFOs. The fees should be stated in kind--e.g., one bushel paddy per acre per season--so that inflation does not erode collections in real terms. Cash equivalent should be welcome at the going rate for paddy.
- 3.\* Rationalize the fee structure to ensure coverage of O&M costs without free riders while permitting optional participation in other DCFO/SLFO activities on an equitable basis.

### Training

#### Essential Recommendations to be Implemented in the Medium Term:

- 1.\* Train trainers at the SLFO level in ME&F, applied business management and financial management. (ISMP)

### Crop Diversification

#### Essential Recommendations to be Implemented Urgently:

- 1.\* Undertake cost-return analysis and evaluation of new crops.

## 1. PROJECT DESIGN

### 1.1 PROJECT OBJECTIVES

There were five major objectives to be accomplished under the ISMP and they are summarized below:

- Objective 1 Assist the IMD/ID to develop and strengthen the Farmer Organizations in order to improve their capabilities to operate and maintain the Distributary Canal System.
- Objective 2 Improve the capability of the Irrigation Department (ID) staff in the operation and maintenance of the Irrigation Systems.
- Objective 3 Support the program for Integrated Management of Major Agricultural Settlements (INMAS) under the Irrigation Management Division (IMD).
- Objective 4 Institutionalize the training capabilities of the Agency personnel involved in the support of improved Farmer Organizations, Project Management and operation and maintenance and management of their Distributary Canal Systems.
- Objective 5 Document the lessons learned for application to other Major Irrigation Schemes in Sri Lanka and in the Region with special consideration to major policy implications and/or changes.

These five objectives were primarily directed to the two major components of the Project, the O&M and FO Development.

To succeed in achieving these objectives, both of these components had to receive support and inputs from the other components of the Project, Financial Management, Monitoring Evaluation and Feedback, Training, Research, Crop Diversification and Commodity Procurement. Integration of these components, in order to achieve the objectives, was done on a continual basis throughout the LOP.

During the Life of the Project major efforts were made to achieve these five objectives. A summary of the achievements which have led to the accomplishment of these five Project objectives follows.

Objective 1. - A total of 130 Farmer Organizations (DCFOs), covering approximately 55,200 Ha of irrigated land, have been formed and registered under the Project as of 30 June 1992. The development of these DCFOs started slowly in 1987 and 1988, but by 1989 the program for establishing the DCFOs was well on its way. It took the first two years of the Project to identify the hydrological boundaries and the exact extent of the area to be included under each DCFO.

In Polonnaruwa and Ridi Bendi Ela Schemes, these boundaries were well established by the end of 1989. However, in the Gal Oya Right Bank and in certain areas of the Left Bank, the boundaries of the DCFOs were still being established in 1991 and finalized only in 1992. To strengthen the DCFOs that were established and to improve their O&M capabilities over the LOP the ID/IMD and TA Contractor initiated the following actions:

- o The relationship between the ID personnel and the members of the DCFOs improved considerably during the LOP from 1987 to PACD because ID staff, especially TAs, began to work closely with the farmers in the rehabilitation of their Distributary Canal Systems. This relationship was further enhanced when the DCFOs under took rehabilitation contracts in their own areas and the ID staff provided day-to-day assistance in construction management, construction practices and in the quality control of the work.
- o Training in Distributary Canal System operation and maintenance was provided to the members of all the DCFOs that were formed by late 1990 and early 1991. This training was conducted by professional trainers using ID/IMD staff as resource personnel. All DCFO field canal representatives were involved in this training along with the senior officers of the DCOs. Emphasis was placed on the practical approach to improve their Distributary Canal operation and maintenance practices. These practical training courses on O&M were extremely successful in helping to achieve Objective No. 1.
- o The development of the Annual Maintenance Plans by the ID and TA Contractor provided the means to thoroughly involve the DCFOs in the maintenance process. ID and Sheladia staff accompanied the DCFO representatives during the Walk-Through Maintenance Survey of their respective Distributary Canal Systems. The result of this collaboration was that a great impact was made in introducing the DCFO representatives to the preventative maintenance requirements and procedures.

Objective 2 - Over the LOP the capabilities of the Irrigation Department staff have been enhanced in operation and maintenance practices under the following programs:

- o Walk-Through Maintenance Surveys were conducted for all Main Systems and for over 92 Distributary Canal Systems under the ISMP to establish the Annual Maintenance requirements for those systems.
- o Annual Maintenance Plans and Cost Estimates were developed for all Main Systems and for the 92 Distributary Canal Systems as a result of the Walk-Through Maintenance Surveys.
- o Implementation of these Annual Maintenance Plans under the Preventative Maintenance Program is to start in 1992.

- o An improved System Operation Program was initiated in all Schemes with the following facilities put in place:
  - Water Management Cell Organizations developed
  - Water Management Cell personnel job descriptions developed
  - Rain gauge network established
  - Meteorological station constructed
  - Field Operation Units established
  - Computer Operation Centres established
  - Water Management Computer Model developed
  - Training in operation of computer model completed
  - Training in Water Measurement and calibration of structures for discharge measurement completed
  - Implementation of the Computer Assisted Water Management Model initiated in two of the seven Schemes during Yala 1992 season.

Objective 3 - The ISMP institutionalized the following concepts in developing the Farmer Organization Program over the LOP and IMD has introduced these same concepts in other Major Irrigation Schemes in Sri Lanka.

- o One farmer group per field channel area
- o Area of DCFO operation is delineated by hydrological boundaries
- o Bottom up approach. ie. FCG-DCFO-SLFO-PMC
- o Introduction of Institutional Organizers to serve as catalysts
- o DCFO Officer elected by the Organization by vote (secret ballot)
- o Introduction of the joint management and participatory approach to FO activities. This approach allows the FOs to reach equitable water distribution agreements through the use of conflict resolution and other techniques that were introduced by ISMP.
- o After obtaining legal recognition, the FOs and DCFOs activated several new activities other than the O&M. Some DCFOs engaged in agri-business and initiated a program to supply agri-inputs to their DCFO member farmers at a price less than the market price.
- o In some ISMP schemes DCFOs organized and purchased agricultural produce from their members utilizing their own development funds and credit from the RRDBS.

- o The sustainability of the Farmer Organizations depends on their ability to continue to become self-reliant and to fulfil their own needs. The togetherness of the farmers will lead to the sustainability of their organizations and the start of new ventures - for example, establishment of paddy mills in the DCFOs and other agro-processing enterprises.
- o Youth organizations should receive training in construction management and quality control.
- o Sustainability of irrigation systems (Main and Distributary) maintenance will be contingent upon the GOSL providing the required funds for the Main System and the DCFOs providing the funds and labour for the Distributary Canal Systems. These funds should be based upon costs developed over LOP for the long-term Preventative Maintenance Program for the Main and Distributary Systems respectively.
- o DCFOs must be required to create and sustain permanent Work Committees for Operation and Maintenance of irrigation systems, Crop Production and Marketing Committee, Education and Training Committee and Financial Management and Monitoring and Evaluation Committee, with well-defined roles and responsibilities. This practice will train more people in management and reduce the work load of the Presidents. Other committees, permanent or special, may be organized later as the need arises. Appointed members should also be allowed to create sub-committee/s under its supervision when necessary.
- o As soon as majority of the DCFOs start engaging in group activities, eg., sales and distribution of farm inputs, marketing of farm produce, service contracts in Operation and Maintenance of irrigation systems, contracts in the rehabilitation of irrigation facilities etc., additional and appropriate training should be given to Institution Organizers in preparation for the change in the name of the positions from institution organizers to Institutional Development Advisers so that corresponding increases in salary may be effected.
- o The government should consider developing a special commendation to award to a DCFO, when the organization has maintained its distributary system in a satisfactory manner and at their own expense.
- o Many DCFOs are already engaged in the sales and distributions of farm inputs such as fertilizers, pesticides and seeds. At least three SLFOs are also engaged in similar activities. At present, profits are distributed as dividend based on the number of shares of stock a member has.

The fact that the number one objective of the farmer organizations in conducting any agribusiness enterprise is SERVICE, profits should therefore be distributed to members

based on patronage and not on the number of shares one has in the business. This means that a member who buys more and sells more through the DCFO outlet, gets more than those members who sold less and bought less, when profit is declared.

- o If IMD retains some of the IOs after the TA team leaves, an assessment should be made of their individual capabilities to train the DCFOs on how to prepare, implement, monitor and evaluate Annual Operation and provides training and technical assistance in construction management and quality control of construction.
- o If IMD chooses not to continue the services of the IOs, the IO responsibilities should be transferred to the ID personnel.. The remaining IMD personnel should concentrate on ME&F, Farmer Training and Inter-Agency Coordination Activities.
- o Implementation progress of the Participatory Approach to the operation and maintenance of distributary canal systems should be assessed by a team composed of the Assistant Directors for Training, Financial Management and ME&F every two years.
- o Prior to Rehabilitation contract work, the DCFO should meet with the general membership and review the contract with them. Full knowledge of contract requirements and estimated costs will engender the necessary spirit of cooperation required to undertake the work and complete it successfully.

Objective 4 - The ISMP Training Programs enhanced the knowledge and changed the attitudes of the ID, IMD and farmers through improved management of the Irrigation Systems.

- o Field Canal Group Training is important and should be provided to all group members. Experience has shown that many trained Field Canal Representatives have not shared the knowledge and skills gained through training with other members. As a result, other than the representatives themselves, the majority of farmers do not know what is happening in the system, and more importantly, their own duties and responsibilities.
- o It was recognized, during the LOP, that it is vital to strengthen the Field Canal Groups and develop cohesiveness within the group in order to create team spirit as well as effort.
- o The IOs played an important role, as catalysts, in the development of farmers and DCFOS. In addition, they enhanced the farmer's knowledge by explaining the importance of record keeping and training them to maintain DCFO accounts and records. In addition, the IOs assisted the DCFOS with bank and financial transactions.

- o Training in leadership, decision making and effective communication methods enhanced the knowledge and skills of the PMs and IDOs. In turn, the PMs and IDOS trained the IOs and DCFO officials as well as imparting their knowledge to the farmers.
- o Financial Management Training Programs were conducted in each scheme. 155 treasurers were trained in FM. This training improved their record keeping and updating of their books when transactions take place.

Objective 5 - During LOP many lessons were learned that will have an impact on major Irrigation Systems in Sri Lanka and perhaps elsewhere. These lessons are presented in detail in Chapter VI of this Volume and are summarized below:

- o Rehabilitation of Irrigation Systems cannot be effectively carried out within the closed period between seasons without placing some land out of irrigation over the LOP.
- o The development of the Farmer Organization is a very slow process and the handing-over the Distributary Canal Systems to them must be planned over a long transition period if the sustainability of the Organizations are to be achieved.
- o Farmer Organizations can be involved in the rehabilitation of their Distributary Canal Systems, provided they are strong and the ID provides training and assistance in construction management and quality of construction.
- o Staggered cultivation can be minimized provided a proper cultivation plan is prepared and implemented at the field canal level.
- o The work done on agronomy during the LOP confirms that small scale rice production cannot sustain an income level which is at least 50% of the national per-capita income level.
- o Other crops can be successfully cultivated and earn higher levels of income than rice production during Yala in well and perfectly-drained paddy fields. In the Yala, vegetables planted in well-drained paddy fields will also yield higher income than rice.
- o Cropping intensity can be increased by planting a third crop during the interim season in between Maha and Yala or Yala and Maha in well and imperfectly-drained paddy lands.
- o DCFOs must have trained grass-roots level voluntary extension worker farmers to provide advice on OFCs to FC group representatives and farmers. They should coordinate with DOA agricultural instructors and other sources for agricultural information.

## 1.2 SCOPE OF WORK AND TECHNICAL ASSISTANCE PROVIDED

### 1.2.1 Scope of Work of the Technical Assistance on the ISMP

The Scope of Work for the Technical Assistance Team was outlined in the Project Paper and in Sheladia's Contract with USAID. This Scope of Work is presented as Annex 1 in the back of this Volume of the Report.

The Technical Assistance (TA) to be provided under the ISMP was expected to play a key role in the assisting the Project meeting in its objectives. Essentially all of the items of work that were included in Annex I were followed closely and monitored on a monthly basis as presented in Sheladia's Monthly Activity Report under "Performance Monitor of the Consultant's Scope of Work". A copy of the last performance monitor from the Consultant's Monthly Activity Report of June 1992 is presented as Table 1-2-1. These monitoring charts cover the period from december 1989 to June 1992. Based upon these performance monitoring Charts (8 sheets), most of the items under the scope of work for each component were undertaken and completed over the LOP.

However, under some of the Project Components, Sheladia provided additional assistance in order to enhance the implementation of the Project. These additional technical assistance efforts are summarized by component as follows:

#### Farmer Organization Development

##### o VOCA Training Program for Women

The women of the Minneriya Scheme formed 17 Women's Organizations under the umbrella of the Distributary Canal Farmer Organizations. The officials of these organizations met and formed the System Level Women's Organization for Minneriya Scheme. Ms. Audrey Lutz, Vice President of Sheladia Associates, Inc. visited the Minneriya Scheme on 15th April 1991 and met the Officials of the System Level Organization. The Officials requested that Ms. Lutz make arrangements for them to receive skill training in processing and preserving fruits and vegetables. When she returned to the United States she made enquiries with the Volunteers in Overseas Cooperative Assistance (VOCA). Subsequently the Regional Representative of VOCA visited the Women's Organizations in Minneriya on 19 March 1992. The Regional Representative agreed to give training assistance to the Women's Organizations and then held discussions with USAID Officials and the Project Director of ISMP confirming that VOCA would be able to send a Volunteer in Mid-May. Mrs. Julie Michiel from VOCA arrived at Galamuna Wijaya on 18 May 1992. The training program continued for six weeks and the women have learned theory as well as the practical approach for making jam and cordials. After a five day training program the women divided into small groups and made the jams on their own. The second group Hatamuna DCFO, started their training program on 2 June 1992 and the number of participants increased day by day.

The women who are planning to make jams and cordials, will receive financial assistance from the local banks to promote their products. Inquiries about their products have been received from the local market.

o Women's Organizations under the ISMP

One of the innovations introduced to the Farmer Organization Program was the formation of Women and Youth Organizations under the umbrella of the DCFOs. This was pioneered in the Minneriya Scheme and followed by Giritale, PSS and Gal Oya LB Schemes. The Giritale and PSS organizations could not gain any support from the IMD or ISMP but Minneriya and Gal Oya LB Women's Groups organized themselves, created income generating activities and developed a spirit of togetherness among themselves. The seventeen women's organizations formed in Minneriya Scheme and the three in Gal Oya LB under the purview of the DCFOs have been very active.

1. women's organizations formed in Minneriya formulated a constitution for their groups and created a System Level Women's Farmer Organization. All of these organizations have opened bank accounts. Some have started sewing classes and some have initiated mushroom cultivation and crafting artificial flowers. The Vice President of Sheladia, Ms. Audrey Lutz donated three sewing machines to the System Level Women's Farmer Organization in Minneriya.

Gal Oya LB women's organization members grouped together and borrowed funds from the People's Bank and the Bank of Ceylon to start new ventures like making garments, animal husbandry and yoghurt processing.

o Marketing

For many years farmers have faced a major problem in marketing their products. In the past they could not get a reasonable price for their produce. There are many government institutions to assist marketing, but they are not active when farmers require the services. Farmers, often are at the mercy of unscrupulous traders and other negative elements.

During 1991 Yala farmers sold their paddy below the guaranteed price and some could not cover their costs after paying loans back to the bank. This was discussed in detail at the PMC meeting and the DCFO meetings in the ISMP areas.

The Sheladia Institutional Development Specialist met the Central Bank's Anuradhapura Regional Manager and explained the situation that the farmers had faced during the 1991 Yala cultivation season. The Sheladia Specialist requested that the Bank and RRDB provide assistance to the Farmer Organizations in purchasing paddy during the coming 1992 Yala season. During the Yala season, the RRDB opened a Bank Branch at Hingurakgoda and granted a loan of Rs. 250,000 to the Ulpothwewa DCFO to purchase agricultural produce from the farmers. When the DCFO began to purchase paddy it

increased to Rs. 7/kg. The lessons learned encouraged DCFOs to make arrangements to buy paddy 91/92 Maha season and 8 DCFOs in Minneriya Scheme also purchased paddy during this season. Other DCFOs learned not to sell paddy below the guaranteed price, from the experience of the other DCFOs. The guaranteed price prevailed in all the ISMP areas during the seasons including Gal Oya RB/LB and RBE. In RBE, and DCFO engaged in purchasing paddy from the farmers in collaboration with the Multipurpose Cooperative Society. The guaranteed price prevailed throughout the Scheme.

In the Kaudulla Scheme, DCFOs purchased 1.8 million rupees worth of paddy from the farmers. In Minneriya Scheme DCFOs purchased about 3.6 million rupees worth of paddy from its members. This is a major break through in FO Development.

#### o Agri-Business

The four schemes of Polonnaruwa District produced an average of 5.8 million bushels per season. Most of their produce was transported outside the District and sold below the guaranteed price. The DCFOs discussed this problem at meetings. Steps were taken in the district to establish paddy mills in a few DCOs.

The IDs discussed this problem with the General Manager of the National Development Bank and formulated a program to assist the farmers. The Bank officials visited the five DCFOs in Kaudulla and Minneriya Schemes and agreed to finance five paddy mills on a pilot basis. This scheme has been approved by the bank authorities and the legal documents will be signed in June 1992.

The DCFOs and PMs must monitor the progress of mills and make arrangements to pay-back the instalments to the Bank. Prompt repayments will determine if loans will be made to the other DCFOs.

#### o Irrigation Sector Assistance Agreement

Irrigation Sector Assistance Agreement is a new approach that has accelerated and enhanced the development of the farmer organizations and ID water management under the ISMP. Under this Agreement, the Distributory Canal Farmer Organizations were encouraged to participate in operation and maintenance of their D-canal systems. To facilitate this, Sheladia's F.O. Specialist has assisted USAID and the GOSL in:

- Drafting the memorandum of understanding to be signed by representatives of FOs, IMD and ID;
- Preparing the criteria and score card that was used to determine whether a DCFO has reached a level of competency to be a part of the agreement;
- Evaluating DCFO candidates for management take-over of distributory canals;

- Identifying the weak points of the Farmer Organization Development Program and recommending and implementing probable solutions and
- Improving the present ME&F system to cater to the present need of the DCFOs.

#### Operation and Maintenance Improvements

- o Sheladia's O&M Engineer and Engineering Assistant completed the Annual Maintenance Plans and submitted reports on the Main System and the twelve DCFOs in the Giritale Scheme. These reports and plans were the basis for replicating the Annual Maintenance Plans for the remaining six Main Irrigation Systems and 189 DCFOs under the Project.
- o The implementation of the Water Management Certification requirements under Tranche 2 and 3 of the Irrigation Sector Assistance Agreement were completed on schedule by the O&M Engineer and \$ 4.0 million transferred to GOSL prior to PACD.

#### Financial Management Improvements

The Sheladia Financial Management Specialists achieved the following F.M. improvements:

- o Instead of O&M Fees, DCFOs levy membership fees on the members. Assistance was provided to IMD in introducing a simple F.M. System to the DCFOs.
- o DCFOs create Development Funds and utilize that money for supplying of agro-inputs and for material for construction work.
- o 125 DCFOs have a balance of Rs. 2,465,314 (more than US\$ 50,000) in their Development Funds.
- o FM Assistants, Institutional Organizers and FC Representatives were trained in Financial Management in order to have sound and viable DCFOs
- o The preparation and the introduction of annual budgets to the DCFOs; the IOs and DCFO officials were trained to implement the budget
- o 155 DCFOs have opened bank accounts
- o 22 DCFOs obtained credit facilities to buy Fertilizer and Agro-Chemicals
- o 17 DCFOs in the marketing of agricultural produce with the concurrence of the Regional Rural Development Bank
- o The opening of RRDB in Polonnaruwa and Ampara District were initiated and expedited

- o Advice and monitoring procedures were given to DCFO Treasurers in the preparation of Income and Expenditure Statements for presentation at the monthly DCFO Meetings
- o Training was delivered to PMs, IDOs and IOs in checking FM books of the DCFO on a periodic basis
- o DCFOs began exploring the possibility of employing a part-time person to conduct an audit of the DCFOs FM books as a requirement of their constitution
- o The FM Account System was introduced to the SLFOs by FM Assistants
- o All SLFOs have opened bank accounts with the State Bank

#### Crop Diversification

The Crop Diversification Specialist initiated the following activities:

- o Inter-disciplinary approach to crop diversification was initiated over the LOP
- o Staggered cultivation practices were minimized in all ISMP Schemes
- o Block and field canal level demonstrations were developed
- o Demonstration of zero-tillage planting in large blocks was promoted
- o Assistance was provided in the production of other food crops in well drained paddy lands during the Maha Season
- o Training for Volunteer Extension Worker Farmers was implemented
- o A seed production program was initiated
- o A mushroom production program was initiated

### Training

Special training was designed and delivered by Sheladia Expatriate Short-term Specialists. These programs were key factors in the success of the O&M and FO Development Components, having included:

- o Field Canal Representatives trained in Operations and Maintenance
- o Technical Assistants trained in Water Measurement Practices
- o IEs trained in Computer Assisted Water Management Model
- o IOs, IDOs and Farmer Officers trained in Financial Management and on MEF
- o ID staff trained in Preventative Maintenance
- o Work Supervisors trained in construction and quality control.





PERFORMANCE MONITOR (IN PERCENT COMPLETE)  
CONSULTANT SCOPE OF WORK

EXHIBIT 1-2-1  
SHEET 3 OF 8

311

SCOPE OF WORK	1989												1990												1991												1992					
	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN											
C. OPERATION & MAINTENANCE																																										
o SURVEY & MAPPING REQUIREMENTS	80	80	80	83	85	87	88	89	90	91	92	93	93	94	94	94	94	95	96	96	96	96	96	97	98	98	99	99	100	100	100											
o DEVELOP DESIGN CRITERIA/TYPE PLANS	60	60	60	60	60	60	60	65	65	65	65	70	72	72	73	74	75	75	77	77	82	83	85	90	92	93	95	96	96	96	96											
o REVIEW & DEVELOP COST DATA FOR ESI/PR	50	53	57	60	70	70	72	73	75	76	77	78	80	85	86	87	88	89	90	90	90	91	92	93	93	94	96	97	97	97	97											
o RECOMMEND SYSTEM MODIFICATIONS AT FC LEVEL	50	50	50	50	50	50	50	50	50	50	50	60	62	65	65	66	67	67	70	72	74	75	80	85	87	98	94	95	97	97	97											
o REVIEW DESIGNS AND DEVELOP PROGRESS REPORTS	50	52	52	55	57	58	58	59	60	62	63	64	66	70	71	73	75	75	77	80	83	88	90	91	92	93	95	96	96	96	96											
o MONITOR CONSTRUCTION PROGRESS & QUALITY CONTROL	50	50	53	55	57	57	58	60	61	64	67	70	75	78	79	81	83	83	85	86	87	88	90	92	94	95	96	97	98	99	100											
o DEVELOP PROGRESS MONITORING METHODS FOR COST CONTROL	80	80	80	80	80	80	80	80	80	85	85	85	86	88	88	90	92	92	93	93	93	93	94	95	96	97	100	100	100	100	100											
o DEVELOP TRAINING COURSE FOR CONST. SUP. AND QUAL. CONTROL	55	55	58	58	60	58	55	60	63	65	67	67	70	75	75	85	90	90	91	92	92	93	94	95	96	97	100	100	100	100	100											
o IDENTIFY SUB-PROJECTS FOR ESI/PR	50	50	50	52	53	54	55	55	55	60	62	65	68	68	69	70	71	72	75	77	79	80	85	90	92	93	96	98	100	100	100											
o CERTIFY SUB-PROJECTS COMPLETION	30	32	35	38	40	42	44	46	46	50	55	58	60	62	64	66	67	68	70	74	77	79	80	80	83	87	90	92	94	96	100											
o DEVELOP CONSTRUCTION PROGRESS CHART	35	75	77	80	82	83	85	86	86	87	88	89	90	91	92	93	94	94	95	95	95	95	95	95	95	95	95	95	95	95	95											
o RECOMMEND PROCUREMENT & EFF. UTIL OF EQUIPMENT	50	50	50	50	50	50	50	50	50	52	52	53	55	60	60	62	64	65	70	72	74	76	80	85	87	98	92	92	93	93	93											
o DEVELOP ANNUAL MAINT PLAN FOR PW/RRE/GORB	25	28	30	33	35	37	40	45	50	55	56	57	60	62	64	68	69	73	80	84	86	88	89	90	92	91	93	94	96	97	98											
o PREPARE PREVENT. MAINT. PROG. FOR PW/RRE/GORB & ASSIST IN IMPLEMENTATION OF PRIORITY REHABILITATION PROGRAM	25	28	30	30	32	33	35	37	40	45	48	50	55	57	60	63	64	70	75	77	80	83	85	88	90	92	94	94	96	97	100											
o DEVELOP TRAINING COURSE ON MAINTENANCE	10	10	15	15	15	17	20	22	25	27	29	34	40	50	55	65	70	75	77	78	80	84	88	90	92	93	100	100	100	100	100											
o PREPARE RECOMMENDATIONS FOR UP-DATING ID MAINT. MANUAL	0	0	0	0	0	0	0	2	4	5	5	7	10	12	14	15	16	20	25	29	35	37	40	45	50	54	70	80	90	95	100											
o PREPARE REPORT TO SUMMARIZE EXPERIENCE, ANALYSE PROGRESS AND MAKE RECOMMENDATIONS FOR IMPLEMENTING MAINT. PROGRAM FOR EACH SCHEME	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
o ASSIST IMPLEMENT PREVENT. MAINT. PROG. FOR GOLB	0	5	10	10	13	15	18	20	22	25	29	30	33	35	37	39	40	42	45	47	50	55	60	65	70	75	80	85	90	94	94											
o PREPARE PREVENT. MAINT. MANUAL FOR GOLB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	20	25	30	35	40	40	40	60	100											
o PREPARE REPORT ON PREVENT. MAINT. PROG. FOR GOLB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0											
CONSULTANT/COUNTERPART	LEONHARDT/DDI - POLONNARUWA/KURUNEGALA/AMPARA												CERDAN/POLONNARUWA - KURUNEGALA - AMPARA																													





PERFORMANCE MONITOR (IN PERCENT COMPLETE)  
CONSULTANT SCOPE OF WORK

EXHIBIT 1-2-  
SHEET 6 OF 8

SCOPE OF WORK	1989		1990												1991												1992				
	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	
f TRAINING CAPACITY ENHANCEMENT	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
o PREPARE LOP TRAINING PLAN	90	90	90	90	90	90	90	90	90	90	90	90	93	93	94	96	96	98	99	99	99	100	100	100	100	100	100	100	100	100	
o ASSIST SLITI TO DEVELOP IN-SERVICE TRAINING PROG.	75	80	80	80	80	85	85	85	87	87	87	87	87	90	92	93	93	94	95	96	96	97	98	98	98	98	100	100	100	100	
o DEVELOP MATERIALS FOR TRAINING P.M.s & ASSIST P.M.s	30	50	50	60	70	70	70	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
o ASSIST IN REFINING I.O. TRAINING COURSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
o ASSIST IN DEVELOPING FM TRAINING COURSE	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
o ASSIST IN DEVELOPING INSTITUTION BASED TRAINING COURSES IN COMPUTERIZED MEF & FM	50	60	60	60	60	60	60	60	60	60	60	60	85	88	90	95	95	96	97	97	97	97	98	98	98	98	98	98	99	100	
o IDENTIFY NEEDS FOR OVERSEAS TRAINING	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
CONSULTANT/COUNTERPART	:ADIKARANBE/GUNASEKERA												:SAI/GUNASEKERA												:GUNASEKERA						



PERFORMANCE MONITOR (IN PERCENT COMPLETE)  
CONSULTANT SCOPE OF WORK

EXHIBIT 1-2  
SHEET 7 OF 8

SCOPE OF WORK	1989												1990												1991												1992						
DESCRIPTION	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JAN	FEB	MAR	APR	MAY								
<b>g RESEARCH</b>																																											
o PARTICIPATE IN COMMITTEE TO SELECT PROPOSELS	50	60	65	67	67	67	70	70	70	75	80	80	85	95	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		
o COORDINATE WITH OTHER AGENCIES	50	60	65	67	67	69	70	71	72	75	76	76	78	80	83	85	87	88	89	90	92	93	94	95	96	96	96	97	97	97	98	98	98	98	98	98	99	99					
	IMD/ID/USAID/IIMI/SAI																																										
<b>d RESPONSIBILITY</b>																																											
<b>h COMMODITY PROCUREMENT</b>																																											
o ASSIST IN PREPARING LISTS & SPECIFICATIONS FOR PROJECT COMMODITIES	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	72	73	75	76	78	80	83	85	88	90	91	92	93	94	96	96	97	97	97	97	97	97	97					
o CARRY OUT ALL OFF-SHORE PROCUREMENT ACTIONS	EXCEPT FOR SOME LOW VALUE COMMODITIES THE CONTRACTOR IS CONSIDERED TO BE RELEASED FROM THIS REQUIREMENT																																										

PERFORMANCE MONITOR (IN PERCENT COMPLETE)  
CONSULTANT SCOPE OF WORK

EXHIBIT 1-  
SHEET 8 OF

SCOPE OF WORK	1989		1990												1991					1992										
DESCRIPTION	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
i CROP DIVERSIFICATION	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
o INTERDISCIPLINARY APPROACH TO CROP DIVERSIFICATION	8	12	17	26	35	48	47	58	54	59	62	65	68	78	72	74	75	75	77	88	88	84	86	88	98	92	93	94	96	98
o MINIMIZE STAGGERED CULTIVATION	48	42	45	48	54	57	57	68	65	78	72	74	78	88	83	84	84	87	88	88	88	89	98	92	93	94	95	96	98	98
o TRAIN FARMERS IN ZEROTILLAGE PLANTING OF PULSE CROPS	8	15	48	45	55	59	68	68	63	65	67	67	67	68	72	73	76	88	88	68	88	85	88	98	92	93	94	95	97	98
o YALA CROP ESTABLISHMENT AND MANAGEMENT	5	6	8	18	48	52	68	64	78	78	78	72	72	73	74	74	74	76	88	85	87	88	92	92	93	94	95	96	97	97
o PROJECT REPORTS	5	9	12	28	33	37	48	45	58	68	78	85	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
CONSULTANT/COUNTERPART	S. SANARAKOON / PREMARATHNA																													

CSWJL.WK1

### 1.2.2 TECHNICAL ASSISTANCE

Sheladia Associates Inc., provided Technical Assistance to support the Government of Sri Lanka in attaining the objectives of the Irrigation Systems Management Project. Sheladia was requested to provide technical advisory services including management, engineering, training, procurement, and other relevant services under the contract with USAID.

Under the ISM Project, Sheladia worked with the Irrigation Management Division (IMD) and the Irrigation Department (ID) of the Ministry of Lands Irrigation and Mahaweli Development (MLIMD) and with other departments and Agencies of the Government of Sri Lanka (GSL) to carry out the second phase of a coordinated Water Management improvement Program begun in 1979 under USAID's Water Management Project in Gal Oya.

Assistance was provided through the ISM Project, at the national level, to upgrade MLIMD institutional capacities to improve the performance of existing major irrigation systems, at the field level to test and demonstrate several new approaches to rehabilitation and management improvements. Coordination with GSL Agencies responsible for Agricultural Extension, Research and other support services to help assure that the improvements in water management are translated into increased agricultural production, was a vital factor in all implementation efforts.

During the five year life of Project, Sheladia was to provide approximately 250 person-months of long and short term local and expatriate professional services in the disciplines of irrigation engineering, farmer organization, agricultural economics, agronomy, finance, systems engineering, computer applications and training. In carrying out the scope of work it was envisaged that Sheladia would utilize local expertise wherever possible through a sub-contract with a Sri Lankan Consulting firm or other arrangements. It was estimated that approximately 116 person-months of Sri Lanka professionals services would be required to effectively carry out the required tasks.

Over the LOP Sheladia provided the following person-months in the various categories as shown in Table 1-2-2.



**TABLE 1-2-2**  
**SUMMARY OF TECHNICAL ASSISTANCE PROVIDED**

CATEGORY OF STAFF	PERSON	REF. TABLE
1. Long-Term Professional (Expatriate)	148.86	(Table 1-2-3)
2. Short-Term Professional (Expatriate)	31.19	(Table 1-2-4)
3. Long-Term Professional (Local)	316.30	(Table 1-2-5)
4. Short-Term Professional (Local)	17.78	(Table 1-2-6)
5. Long-Term Administrative (Local)	504.56	(Table 1-2-7)
6. Short-Term Administrative (Local)	15.17	(Table 1-2-8)
7. Sub-Contract Professional (Expatriate)	24.30	(Table 1-2-9)
8. Sub-Contract Professional (Local)	53.30	(Table 1-2-10)
9. Home Office Management (Expatriate)	4.90	(Table 1-2-11)
10. Home Office Technical/Proc. (Expatriate)	15.15	(Table 1-2-12)
11. Home Office Administrative (Expatriate)	27.80	(Table 1-2-13)
Total Person-Months	1159.31	

The detailed distribution of people in the eleven categories above are presented in Tables 1-2-4 to 1-2-14 at the end of this Section. The schedule of staff deployment over the LOP is presented in Exhibit 1-2-1. The estimated level of effort compared to the actual person-months expended is reflected in Table 1-2-3 below.

**TABLE 1-2-3**  
**ISMP TECHNICAL ASSISTANCE TEAM**  
**COMPARISON OF ESTIMATED VS ACTUAL PERSON-MONTHS**

	<u>Original</u> <u>(P.M)</u>	<u>Actual</u> <u>(P.M)</u>	<u>Under-Run/</u> <u>Over/Run</u>
H.O Professional - (Exp in US)	50.00	20.05	- 29.95
HO Professional - (S.T. in Sri Lanka)	25.00	31.19	+ 5.19
Sub Total H.O Professional	75.00	51.24	- 24.76
Field Professional (L.T. Exp)	129.00	148.86	+ 19.86
Field Professional - (L.T. Local)	24.00	316.30	+ 292.30
Field Professional (S.T. Local)	12.00	17.78	+ 5.78
Field Professional (Sub-Contract Exp)	46.00	24.30	- 21.70
Field Professional (Sub-Contract Local)	80.00	53.30	- 26.70
Sub-Total Field Professional	291.00	560.54	+ 269.54
HO Administrative - (USA Exp)	57.00	27.80	- 29.20
Field Administrative (L.T. Local)	355.00	504.56	+ 149.56
Field Administrative (S.T. Local)	-	15.17	+ 15.17
Sub Total Field Administrative	412.00	547.53	+ 135.53
Total Field and H.O (Exp & Local)	778.00	1159.31	+ 381.31
Long-Term Professional (Expatriate)			

Original estimates called for six long-term professional expatriate team members for a total of 147 PM. They were:

Chief -of-Party (60 PM);  
O&M Engineer (36 PM);  
Farmer Organization Specialist (18 PM);  
Training Specialist (15 PM); and  
Economist - MEF/FM Specialist (18 PM).

The Farmer Organization Specialist was provided under a Sub-Contract to Sheladia by Colorado State University. The position is described in the Sub-Contract (Expatriate) category. A discussion of the remaining five long-term expatriate positions follows.

Dr. L.E. Haley was Chief-of-Party for the first two years of the Project. Mr. W.J. Leatham followed for one year until he became terminally ill. Mr. Leatham did an outstanding job during his tenure. Mr. C.F. Leonhardt, who served as O&M Engineer from 16 August 1987 to January 7, 1991, was promoted to Chief-of-Party.

The changes in this position, during the LOP, could have been a constraint, however, due to the fact that all three Chiefs-of-Party each had over 35 years of experience on Projects similar to the ISMP, allowed transition from one to the other to be minimal. These changes had little effect in the overall performance of the TA Team.

Furthermore, Mr. Leonhardt provided continuity since he had been with the project since inception. His appointment to COP reinforced the collaborative and coordinative project efforts.

Originally the O&M Engineer position was planned for 36 months. However, during the Project USAID decided to extend the position until PACD to ensure that the Preventative Maintenance Program and the Systems Operation Water Management Program was in place. These Programs then could be implemented in all Seven Schemes and sustained after PACD.

The Training Specialist's assignment was planned for 15 person-months. The actual time spent in Sri Lanka was 15.55 months. The Economist, who was to provide Technical Assistance for the MEF and FM Components of the Project was extended from his original 18 month assignment to 21 months. This extension was approved by USAID in order to conclude the MEF design and to prepare the Economic Cost Effective Analysis Report.

Therefore, during the five year Project period, the five Long-Term Professional Expatriate staff expended 148.86 PM compared to the estimated 129 PM. This increase of about 20 PM is reflected in the extension of the O&M Engineer's assignment. Table 1-2-4 presents detailed information of the Long-Term Professional Expatriate Staff assignments.

#### Short-Term Professional (Expatriates)

Originally 25 pm were estimated for short-term participation,

however, during the latter part of the Project, at the request of USAID, a 9.5 pm assignment was added for the position of a Farmer Organization Specialist. This Specialist assisted USAID/IMD in the implementation of the Irrigation Sector Assistance Agreement.

The Actual Sheladia Short-Term Professional Expatriate input was 31.19 P/M. Besides the Short-Term Project management and Project Director staff, which totalled about 12.5 person-months over the LOP, the remaining 8.0 person-months provided an MEF Specialist (3.8 PM); a Computer Specialist (1.9 pm) and a Water Management Specialist (2.3 PM).

Essentially very little technical input to the Project was provided by Short-Term Professional Expatriates except in the three disciplines listed above. This low input factor was planned for in the Project Paper as the Long-Term Expatriate and Local Professionals were to accomplish most of the technical services on the Project (about 95%). Table 1-2-5 presents the details of the Short-Term Professionals Expatriate Staff.

#### Long-Term Professional (Local)

Table 1-2-6 presents a detailed list of Sheladia Long-Term Local Professional Staff. A total of 316.30 PM were provided during the LOP, a sharp increase in the estimated 90 person-months, as outlined below:

The estimated staffing for long-term local professional staff the follows:

O&M Engineer	-	30 Person-Months (Sub-Contract)
F.O Specialist	-	24 Person- Months
FM Specialist	-	36 Person-Months (Sub-Contract)
		-----
Total		90 Person-Months

Although the local professional staff exceeded Project Paper estimates, it was deemed essential by both USAID and IMD ID in order to meet Project goals. It was recognized, early in the ISMP, that the Project Paper concept of local professionals working together with expatriates, on the TA team, was a sound concept. Indeed, Sheladia believes that the local professional participation was a major factor in the Project's success.

Table 1-2-6 presents the detailed distribution of the Long-Term Local Professional staff.

#### Short-Term Professional (Local)

There 12.00 person-months was estimated for Short-Term Professional Local staff. During the LOP four short-term personnel provided Project services: A Computer Specialist (11.26 PM); Program Assistant (3.00 PM); and a Drafts Person (3.52 PM) for a total of 17.78 person-months.

Table 1-2-7 presents the detailed distribution of the Short-Term Local Professional staff.

#### Long-term Administrative (Local)

A total of 355.00 person-months was estimated for this category. The total administrative support required during the LOP was 504.56 of which 275.44 person-months were provided by drivers. Originally, the vehicles along with drivers were to be phased out as the expatriates departed the Project so that during the last two years of the Project only one vehicle and one driver would be needed. The phasing of vehicles was as follows:

1st Year	5 Vehicle	=	5 x 12	=	60 PM
2nd Year	4 Vehicles	=	4 x 12	=	48 PM
3rd Year	3 Vehicles	=	3 x 12	=	36 PM
4th Year	1 Vehicle	=	1 x 12	=	12 PM
5th year	1 Vehicle	=	1 x 12	=	12 PM
Misc. Driver Part Time		=		=	3 PM
					-----
	Total				171 PM

However, since the five vehicles were needed by the Sheladia TA team continuously up to PACD, some 104.44 person months were added to the Sheladia Local Administrative Staff requirement.

The Sheladia local support staff proved to be of a very high calibre and supported the team in an efficient and professional manner throughout the Project.

The average on the Long-Term Local Administrative staff then becomes  $504.56 - (355 = + 104.44)$  or only about 45.12 person months. Table 1-2-8 presents the detailed distribution of the Long-Term Local Administrative staff.

#### Short-Term Administrative (Local)

There were no pms estimated for short-term local administrative support. During the LOP a total of 15.71 person-months were expended for a part-time Secretary (5.43 PM); Office Assistant (8.00 PM) and Short-Term driver (1.74 PM). Table 1-2-9 presents the detailed distribution of the Short-Term Local Administrative staff.

#### Sub-Contract (Expatriate)

Originally 46.00 person-months were estimated to be provided by Colorado State University (CSU), primarily on the Farmer Organization Development Program. However, only 18.00 person-months were provided by CSU on the Project. Subsequently, a Training Specialist was Sub-Contracted by Sheladia from Louis Berger International for a period of 6.30 person-months.

Therefore, Sub-Contracted expatriate input was 24.60 person months over the LOP. Table 1-2-10 presents the detailed distribution of this Expatriate Sub-Contract input to the Project.

### Sub-Contract (Local)

Originally 80.00 person-months were estimated to be provided by the Local Consultant Resource Development Corporation (RDC) over the LOP. The actual Local Sub-Contract input to the Project was; RDC Management (2.00 PM); RDC Financial Management Specialist (21.00 PM); RDC Irrigation Engineer (24.00 PM); and a Training Specialist from TEAMS (6.30 PM) or a total of 53.30 person-months. Table 1-2-11 presents the detailed distribution of the Local Sub-Contract input to the Project.

### Home Office Management (Expatriate)

During the LOP Sheladia Vice President, Ms. Audrey Lutz provided Management Services for the Project. Approximately 4.9 person-months were expended against 5.0 person-months planned. (See Exhibit 1-2-12).

### Home Office Technical/Procurement (Expatriate)

Home Office Technical and Procurement Services was estimated at 45.00 person-months, however, only 15.15 person-months were needed to back-stop the Project. The short-fall was directly related to the Procurement Services being taken over by IMD/ID at the beginning of the Project. See Table 1-2-13 for the break-down of the Home Office people involved in Technical and Procurement Services over the LOP.

### Home Office Administrative (Expatriate)

In the original contract, 57.00 person-months was estimated for Administrative Services, however, only 27.80 person-months were expended over the LOP. See Table 1-2-14 for the category of Administrative Personnel provided during the LOP.

## 1.3 IMPLEMENTING AGENCIES INVOLVED

ISMSP was the responsibility of the Irrigation Management Division (IMD) and the Irrigation Department (ID) of the Ministry of Lands, Irrigation and Mahaweli Development (MLIMD). IMD, as the lead organization, managed the Project under the Director of IMD. A Project Director was assigned by IMD to manage the Project day to day operations over the LOP. A Project Organization Chart is attached as Exhibit 1-3-1. Exhibit 1-3-2 (3 Sheets) presents the detailed ID Range Organization Charts for Polonnaruwa, Ampara and Kurunegala Range respectively.

These four Organization Charts reflect the lines of management and co-ordination for ISM Project implementation. Line Agencies i.e., Department of Agriculture, Agricultural Extension, Agrarian Services, Land Commissioners Department, etc. These Agencies provided support services to ISMSP over the LOP.

NAME	EXPAT / LOCAL	POSITION	DATE OF ARRIVAL (dd-mm-yy)	DATE OF DEPARTURE	TOTAL NO OF MAN MONTHS
DR. LOUIS E. HALEY	EXPAT	CHIEF-OF-PARTY	13-8-87	12-7-89	23.00
W.J. LEATHAM	EXPAT	CHIEF-OF-PARTY	5-8-89	16-9-90	13.40
SETH SCHICK	EXPAT	ECONOMIST	25-10-87	24-7-89	21.00
H. ROBERTS	EXPAT	TRAINING ADVISER	21-8-87	16-11-88	15.55
C.P. LEONHARDT	EXPAT	OGM ENGINEER	16-8-87	7-1-91	40.75
		CHIEF-OF-PARTY	8-1-91	30-6-92	18.77
TITO CERDAN	EXPAT	OGM ENGINEER	18-2-91	30-6-92	16.39
					148.86

TABLE 1-2-5  
SHORT TERM PROFESSIONAL (EXPATRIATE)

HONORIO BAUTISTA	EXPAT	PROORGANIZATION SPECIALIST	16-9-91	30-6-92	9.50
A. LUTZ	EXPAT	SAI MANAGEMENT	5-4-87	13-4-87	0.30
			10-11-87	22-11-87	0.44
			7-6-89	21-6-89	0.50
			30-8-90	13-9-90	0.50
			10-4-91	18-4-91	0.30
			6-10-91	18-10-91	0.42
			14-6-92	28-6-92	0.54
K. SMITH	EXPAT	MEP SPECIALIST	9-1-91	2-4-91	2.81
		MEP SPECIALIST	13-1-92	12-2-92	1.00
G. MURKLEY	EXPAT	COMPUTER SPECIALIST	15-3-90	11-5-90	1.90
S. SKOGERBOE	EXPAT	W/MANAGEMENT SPECIALIST	3-11-89	27-11-89	0.83
		W/MANAGEMENT SPECIALIST	3-1-90	17-3-91	1.49
M. REDDITT	EXPAT	SAI PROJECT DIRECTOR	7-8-87	8-10-87	2.07
S. PFLEUGER	EXPAT	SAI ADMINISTRATION	7-8-87	4-9-87	0.94
R. NOTHSTEIN	EXPAT	SAI PRJ. DIRECTOR	23-7-89	11-8-89	0.58
D. BRADBURY	EXPAT	SAI PROC. SPECIALIST	11-11-87	3-12-87	0.77
		SAI PRJ. DIRECTOR	21-8-88	2-9-88	0.42
		SAI PRJ. DIRECTOR	18-2-89	18-4-89	2.00
E. HODGKINS	EXPAT	W/SHOP COORDINATOR	16-9-87	21-10-87	1.18
J. TWAROWSKI	EXPAT	SAI PROJECT DIRECTOR	29-4-92	19-6-92	1.70
					30.19

TABLE 1-2-6  
LONG TERM PROFESSIONAL - LOCAL

NAME	EXPAT / LOCAL / LTP/SAI	POSITION	DATE OF ARRIVAL	DATE OF DEPARTURE	TOTAL NO OF MAN MONTHS
S. GANEWATTE	LOCAL	P.O. SPECIALIST	25-8-87	10-10-90	37.56
M.K. ADIKARANGE	LOCAL	INST. DEV. SPECIALIST	18-2-90	30-6-92	28.39
S. BALASINGAM	LOCAL	IRRIGATION ENGINEER	1-2-90	31-1-92	24.00
S. SAMARAKOON	LOCAL	AGRONOMIST	1-9-88	30-6-92	46.00
D. WEERAKOON	LOCAL	ENGINEERING ASSISTANT	16-7-90	30-6-92	23.52
M. AMARAKOON	LOCAL	ENGINEERING ASSISTANT	10-9-90	30-6-92	21.70
K. VALLIPURAM	LOCAL	ENGINEERING ASSISTANT	16-4-90	30-9-90	6.50
K. VALLIPURAM	LOCAL	ENGINEERING ASSISTANT	01-1-91	30-6-92	18.00
S. SENEVIRATNE	LOCAL	ENGINEERING ASSISTANT	13-6-91	30-6-92	12.93
R. KANDIAH	LOCAL	PROGRAM ASSISTANT	15-3-90	30-9-90	6.53
R. KANDIAH	LOCAL	PROGRAM ASSISTANT	8-4-91	24-4-92	12.57
P. PERIYASAMY	LOCAL	AGRICULTURIST	1-7-88	31-8-90	26.00
T.M.R.S. JAYAMPATHI	LOCAL	DRAFTSMAN	23-1-89	15-3-91	25.77
S. NEELAWELA	LOCAL	DRAFTSMAN	12-3-91	13-3-92	12.06
D.S.A. KULASEKERA	LOCAL	SYSTEMS OPERATOR	01-10-89	24-12-90	14.77
					316.30

TABLE 1-2-7  
SHORT TERM PROFESSIONAL - LOCAL

A. NANAYAKKARA	LOCAL	COMPUTER OPERATOR	1-12-87	8-1-88	1.26
A. ATHURELIYA	LOCAL	COMPUTER OPERATOR	1-1-90	31-10-89	10.00
S. MUMASINGHE	LOCAL	PROGRAM ASSISTANT	16-3-90	16-6-90	3.00
MALKANTHI	LOCAL	DRAFTSMAN	16-3-92	30-6-92	3.52
					17.78

TABLE 1-2-8.  
LONG TERM ADMINISTRATION - LOCAL

P. MANSOOR	LOCAL	OFFICE MANAGER	11-6-87	15-5-89	23.15
A.V. HETTIARATCHI	LOCAL	OFFICE MANAGER	1-9-89	30-6-92	34.00
USHA LOURENSZ	LOCAL	SECRETARY	4-11-87	30-6-92	55.00
D.V. DHANAPALA	LOCAL	SECRETARY	28-9-87	30-6-92	
M. JAYAWARDENA	LOCAL	SECRETARY	2-6-88	30-4-89	10.
AJITH HEMANTHA KUMAR	LOCAL	DRIVER	19-12-87	30-6-92	54.71
A.G. DANIEL	LOCAL	DRIVER	8-10-87	30-10-88	12.77
A.G. DANIEL	LOCAL	DRIVER	1-6-90	30-6-92	25.00
M.L. CHANDRADASA	LOCAL	DRIVER	25-10-88	30-6-92	44.23
M.D. ANDREW	LOCAL	DRIVER	1-1-88	30-6-92	54.00
M.D.H. PAUMASIRI	LOCAL	DRIVER	1-1-88	30-6-92	54.00
A. AMARASINGHE	LOCAL	DRIVER	9-9-87	30-3-90	30.73
G.D. WILSON	LOCAL	MESSENGER / CLERK	1-8-87	4-3-89	21.00
THILAKASIRI DE SILVA	LOCAL	MESSENGER / CLERK	1-1-90	31-3-92	27.00
					504.56

TABLE 1-2-9  
SHORT TERM ADMINISTRATION - LOCAL

A. AKBAR	LOCAL	SECRETARY	1-8-87	2-11-87	3.07
AHAMED	LOCAL	DRIVER	19-8-87	30-9-87	1.74
MIRAN UVAIS	LOCAL	OFFICE ASSISTANT	1-1-88	31-8-88	8.00
K. DE S. WIJAYARATHNE	LOCAL	SECRETARY	17-8-90	21-9-90	1.51
K. DE S. WIJAYARATHNE	LOCAL	SECRETARY	16-3-92	19-4-92	0.85
					15.17

TABLE 1-2-10  
SUB-CONTRACT (EXPATRIATE)

J. WILKINS-WELLS	EXPAT	C.S.U. (SUB-CONTRACT)	14-10-87	11-4-89	18.00
J. Mc CALLUM	EXPAT	TRAINING SPECIALIST	1-10-90	19-4-91	6.30
					24.30

TABLE 1-2-11  
SUB-CONTRACT PROFESSIONAL - LOCAL

: RAJA PERERA	: LOCAL	: RDC MANAGER	: INTERMITTENT	: 2.00 :
: M.A. PERERA	: LOCAL	: FINANCIAL CONSULTANT	: 19-10-87 : 19-7-89	: 21.00 :
: D.S.A. KULASEKERA	: LOCAL	: SYSTEMS OPERATOR	: 1-10-87 : 1-10-89	: 24.00 :
: H. PREMARATNE	: LOCAL	: TRAINING SPECIALIST	: 1-10-90 : 9-4-91	: 6.30 :
:	:	:	:	:
:	:	:	:	: 53.30 :

TABLE 1-2-12  
HOME OFFICE MANAGEMENT (EXPATRIATE)

: AUDREY LUTZ	: EXP	: VICE PRESIDENT/MANAGER	: INTERMITTENT	: 4.90 :
:	:	:	:	:
:	:	:	:	: 4.90 :

TABLE 1-2-13  
HOME OFFICE TECHNICAL/PROCUREMENT (EXPATRIATE)

: K. SMITH	: EXP	: MEF SPECIALIST	: 15-12-90 : 17-12-90	: 0.14 :
: K. SMITH	: EXP	: MEF SPECIALIST	: 5-4-91 : 4-5-91	: 0.09 :
: E. HODGKINS	: EXP	: FACILITATOR	: INTERMITTENT	: 0.48 :
: M.L. CIZAR	: EXP	: PROCUREMENT	: INTERMITTENT	: 0.01 :
: J. TWAROWSKI	: EXP	: PROJECT DIRECTOR	: INTERMITTENT	: 6.42 :
: M. REDDIT	: EXP	: PROJECT DIRECTOR	: INTERMITTENT	: 1.93 :
: D. BRADBURY	: EXP	: PRJ. DIRECTOR/PROCUREMENT	: INTERMITTENT	: 3.25 :
: B. NOTHSYBIN	: EXP	: PROJECT DIRECTOR	: INTERMITTENT	: 0.27 :
: B. FRAZIER	: EXP	: PROJECT DIRECTOR	: INTERMITTENT	: 2.56 :
:	:	:	:	:
:	:	:	:	: 15.15 :

TABLE 1-2-14  
10. HOME OFFICE ADMINISTRATION (EXPATRIATE)

: J. COLLIER	: EXP	: SECRETARY	: INTERMITTENT	: 1.15 :
: S. PFLUEGER	: EXP	: ADMIN. ASSISTANT	: INTERMITTENT	: 1.54 :
: D. SHELLEY	: EXP	: EXEC. SECRETARY	: INTERMITTENT	: 13.36 :
: J. SWIPE	: EXP	: ACCOUNTANT	: INTERMITTENT	: 1.57 :
: S. SEVED	: EXP	: ACCOUNTANT	: INTERMITTENT	: 4.04 :
: B. SCHICKRAM	: EXP	: SECRETARY /	: INTERMITTENT	: 5.02 :
: D. PYLE	: EXP	: SECRETARY	: INTERMITTENT	: 1.12 :
:	:	:	:	:
:	:	:	:	: 27.80 :

::

## 1.4 PROJECT IMPLEMENTATION STRATEGIES

The Project utilize an interdisciplinary approach of institutional strengthening to achieve its goals and objectives. A Multi-disciplinary Team assisted IMD/ID and the GOSL. Close co-ordination and co-operation between TA team members and Host Country counterparts was one of the general strategies and this proved most effective.

Over the five year Life of Project, one of the implementation strategies was to develop Annual Work Plans in October of the previous year followed by a workshop to review the Work Plans for each component and to modify and revise the Annual Work Plans based upon agreements made at the workshop. By 31 December the Plans were ready for implementation in January of the following year. This procedure was following throughout the LOP and was found to be an efficient and constructive strategy.

One of the most important tasks was to test and demonstrate the cost effectiveness of various types of rehabilitation, O&M and FO strategies and to make comparisons of those strategies using different major Irrigation Schemes in Sri Lanka.

Work on this important effort was not initiated until early 1989 by the TA Team and was eventually turned over to a Research Study based upon a decision taken at the Mid-Term Evaluation Workshop. This important Research Study is just being concluded and will present the necessary strategies for implementing future Rehabilitation and FO Development Projects in Sri Lanka and in the Region.

### 1.4.1 Rehabilitation and O&M Improvement Strategies

Rehabilitation - The Project Paper did not clearly define the rehabilitation terminology-Essential Structural Improvement (ESI) to be applied to Polonnaruwa Range Schemes and Pragmatic Rehabilitation (PR) to be applied to the Gal Oya Right Bank System in the Ampara Range. Since fund allocation for ESI in Polonnaruwa (Rs. 1800/ Acre) differed considerably from the funds allocated for PR in Ampara (Rs. 2500/Acre) it is believed that the difference between these two terminologies was the relative level of expenditure between the two. However, in both cases the funds allocated were purposely designed at a very low level which necessitated the implementation of a rehabilitation program which would only provide essential rehabilitation improvements for both Ampara and Polonnaruwa Range Systems. These essential improvements were planned to bring the maintenance of the system up to a level that could be sustained indefinitely provided the long-term Preventative Maintenance Program was established during the LOP and then implemented after the rehabilitation had been completed.

Essential Structural Improvements and/or Pragmatic Rehabilitation under the LSMP includes the follow rehabilitation work to bring the systems to a level when they could be sustained:

- o De-silting of the canals
- o Stabilization of canal banks by adding retaining walls or dry rubble packing
- o Reconstruction, modernization or improvement to existing structures
- o Addition of new irrigation structures
- o Construction of water measurement and control structures.

The basic strategy to implement ESI and PR was to first rehabilitate the main and branch canals during the first two years of the project (1987 and 1988) and then to rehabilitate the D and F canals in the remaining three years (1989, 1990 and 1991). This strategy was predicated on the assumption that the farmer organizations would be well formed and developed by the third year so that they could participate in the rehabilitation of their respective distributary canal systems. Furthermore rehabilitating the main and branch canals first, ensured that the carrying capacity of the main system was adequate to carry all of the D and F canal when they rehabilitated in the third to fifth years.

The strategy for implementing the rehabilitation of the systems was correct, however with only five construction seasons (the 2 months between the end of Yala and the beginning of Maha) only a total of 10 months to complete 2222 km of canals. Totally an impossible goal under any circumstance. Therefore, the overall rehabilitation planning strategy was ill-conceived from the beginning and even with ideal conditions in the field (no civil disorder) only about 60% to 65% of the canals would have been completed over the five year LOP by PACD.

Preventative Maintenance Program. - The strategy for implementing the Preventative Maintenance Program was outlined in the Project Paper and involves a series of LOP actions that must be accomplished if the Preventative Maintenance Program is to be completed by PACD and ready to implement there after.

Exhibit 1.4.1 Presents the Schematic Diagram showing the actions that must be taken to develop the Preventative Maintenance Program over the LOP.

As can be seen by the Schematic Diagram the Preventative Maintenance Program has been broken down into two systems; the Main System to be operated and maintained by the Irrigation Department and the Distributary System to be operated and maintained by the Farmer Organizations. In each case the same activities are involved to develop the Preventative Maintenance Program. The strategy to implement the Program was to first develop the Main System Annual Maintenance Plans and Costs for all of the seven Schemes in the Project. After developing the Annual Costs for the Main Systems they would be submitted to the GOSL for budgeting the appropriate maintenance funds after LOP in order to implement the Preventative Maintenance Program.

The development of the Annual Maintenance Plans and Costs for the Distribution Canal Systems of the Farmer Organization (DCFOS) were

planned to be implemented as the DCFOs were formed so that joint efforts between the ID and members of the DCFOs could conduct the Walk-Through Maintenance Survey. This strategy was the key to success of the implementation of the DCO Annual Maintenance Plans of the follow on Preventative Maintenance Program after PACD.

Improvements to Systems Operations - The strategy undertaken for the implementation of Improvements to Irrigation Systems Operations involved various activities. Those activities have been identified and listed down in sequence. The activities were charted showing the various steps to be undertaken including those to be undertaken in conjunction with the strengthening of the participation of the DCFOs. Based on the chart an Action Plan was developed to guide the implementors in their course of action. The Irrigation Operations Improvement Chart is presented as Exhibit 1.4.2.

#### 1.4.2 Farmer Organization Development Strategies

The Farmer Organization concepts and strategies developed and followed in the Gal Oya Water Management Project and the INMAS Program was accepted and followed in general, in the ISMP Farmer Organization Development Program, however, some major modifications were adopted under ISMP; these major modifications were:

Appointment of a Secretary of the FCG - The Field Canal Group (FCG) continues to be the lowest level in the FO structure. The FCG was further strengthened with the appointment of a Secretary for each FCG to keep a record of important happenings, major decisions and to support the Field Canal Representatives. Some times the Field Canal Representatives keeps the records of his group meetings and fills this position as the Secretary.

The Distributary Canal Farmer Organization (DCFO) - The improvements made to the organization structure and functions of the DCFO over the LOP are as follows:

- o Membership of the DCFO - All farmers using water from the distributary canal irrespective of their tenurial status are entitled to membership in the DCFOs.
- o All Farmer Representatives form the Executive Committee/ Committee of Management of the DCFO - This Committee elects their office bearers by secret ballot. The constitution by-laws and the election of office bearers have to be ratified by the General Membership of the DCFO.
- o Financial Management and Control -

Financial Management and Control are important management responsibilities which includes reconciliations of bank accounts and preparation of income and expenditure accounts. Annual audits are the management tools necessary for the DCFOs to maintain accountability. Necessary guidance in FM is provided by the FM Assistants who is assigned to the Project Managers Office and are permanent employees of IMD.

o Appointing Institutional Organizers as Catalysts -

At the inception of ISMP, graduate IOs were recruited as catalysts. However, due to the high attrition rate IMD changed the educational qualifications. This change allowed persons who possess the GCE A/L or equivalent technical or professional qualifications to be employed as IOs. These catalysts were provided with a two year contract and were given a three weeks training program for indoctrination purposes. While working they were given in-service training programs as a refresher course and were provided additional training to enhance their capabilities.

o Recruitment of Employees of the DCFO - The DCFOs recruited their own employees such as Jalapalaka (Water Masters) and Sales Assistants to sell fertilizer and agro-chemicals.

o Women's and Youth's Organizations - The most innovative strategy introduced to the DCFO was the establishment of youth and women's organizations under the umbrella of the DCFO.

o FC Reps. and Farmers Participation in Walk-Through Surveys. The Field Canal Representatives and farmers associate closely with the ID personnel in carrying out the Walk-Through Maintenance and Operation Surveys. At the same time, farmers learn the technical skills while accompanying the ID staff in the identification rehabilitation, maintenance and operation requirements. This close relationship was a very vital and important factor in establishment of criteria for maintaining the irrigation system to a sustainable level.

o The Area Committees/Area Councils - In Parakrama Samudra, Minneriya, Kaudulla and Gal Oya LB Schemes they have Area Councils in between DCFOs and Project Management Committees. When the Scheme is large, it is better to have an Area Council which meets and discuss the critical problems. If a decision can be made at the Area Council level, it is fine, otherwise the problem must forwarded to the PMC for final decision.

o The System Level Farmer Organization (SLFO) - There are six System Level Farmer Organizations in ISMP areas. All Farmer Representatives are members of the SLFO and officers (President, Secretary, Treasurer) will be elected at the General Meeting of the SLFO. The System Level Farmer Organizations have their own By-Laws, but so far they have not received the official registration or recognition from the Commissioner of Agrarian Services.

o The Project Management Committee (PMC) - The Project Management Committee is a Government Organization set up at each level wholly for Policy, Administration and Management of the Project. The PMC is constituted of the Project Level Officers and Presidents of each DCFO.

o DCFOs Participation in Agro-Inputs Supply and Marketing. -

DCFOs have successfully organized to supply agro-inputs to their own members and have purchased the agro-produce from them. They have contacted local banks for assistance for this operation.

#### 1.4.3 Financial Management

The Financial Management Program was made a part of the ISMP design in order to permit DCFOs to collect and manage O&M fees. Later, this was expanded to induce the management of funds for agri-business activities and contracts. The strategies used were as follows:

- o Design mechanism for the collection of O&M fees.
- o Create public awareness, in favour of fee (dues) collection.
- o Work with IMD to develop a program which determines O&M funding needs and priorities, projects O&M funding needs over a five-year period, forecasts the available O&M payments, accounts for expenditure, of funds and coordinates fee collection with prioritized O&M requirements.
- o Train DCFO representatives in accounting, book-keeping and cost analysis.

#### 1.4.4 Monitoring Evaluation and Feedback

The strategy for developing the REF System was to:

- o identify the performance indicators required to improve the performance of the Irrigation Main and Distributary Canal Systems
- o Refine the performance indicators based upon management's needs at Scheme, District and National Level
- o Review data collection procedures, establish how collection requirement procedures, develop reporting formats and sampling methods and the frequency of collection and reporting reports on Monthly, seasonal and Annual to be prepared
- o MEF Specialist to work with IMD/ID and other agency staff to identify appropriate field staff collect data and provide training materials and train staff at trainer for field data collection
- o Develop appropriate computer programs to analyze data collected, document the use of data analyzed and train staff in utilizing the data analyzed program

#### 1.4.5 Training Capacity Enhancement

The strategy to implement this component was to develop the Life of Project Plans which specify training activities, both in-country and overseas. Then candidates were identified, selected for training and training activities were evaluated after completion of the training.

In-service training was carried out at Galgamuwa Irrigation Training Institute (GITI) and elsewhere for Irrigation Engineers, Technical Assistants and Work supervisors.

In-service Training for Project Managers, IDOs, and FOs was accomplished primarily at ARTI.

Initially in-service training was delivered by GITI and ARTI and later other relevant in-service training was conducted.

Overseas training was planned and took place in countries within Asia and in the USA for all levels of ISMP participants from Management down to selected farmers.

#### 1.4.6 Crop Diversification

Since the crop diversification component was incorporated into the Project after start-up, the strategies employed were developed jointly by USAID, the GOSL and the Sheladia Team. The major strategies were to:

- o Promote OFC cultivation through the establishment of demonstration plots
- o Develop and use linkages with DOA for information extension, sources of seed, etc.
- o Recruit and train Volunteer Farmer Extension Workers
- o Use DCFO network and Women's Organization to raise awareness

#### 1.4.7 Research

The strategy for implementing the Research Component of the Project was for USAID to assign an organization to assist in the implementation. The International Irrigation Management Institute (IIMI) received a Co-operation Agreement from USAID to manage the Research component and to monitor the progress over the LOP.

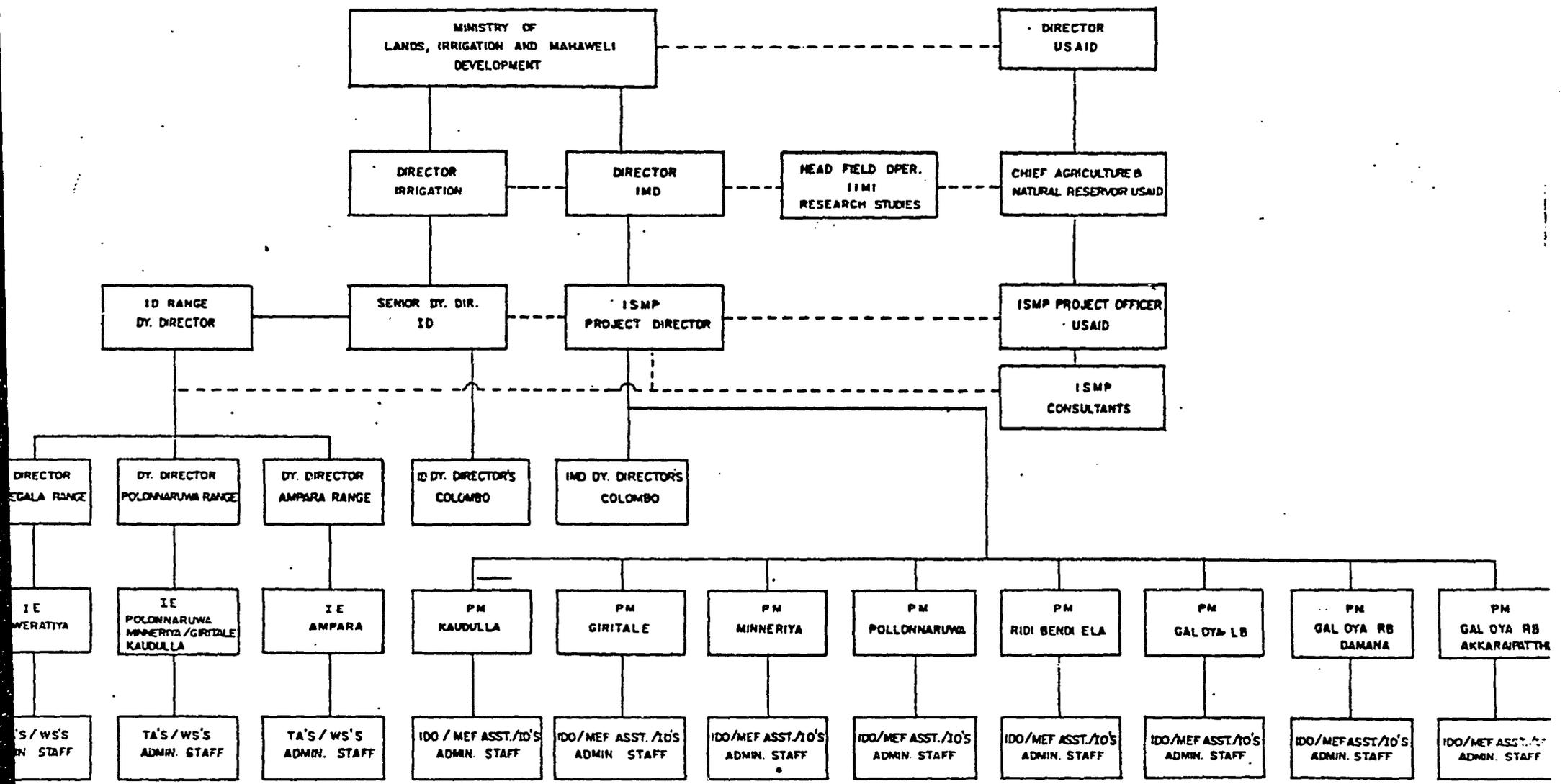
#### 1.4.8 Commodity Procurement

Procurement was originally Sheladia's responsibility. Sheladia was to assist IMD/ID in the procurement of the items proposed in the Project Paper. Subsequently, after the start of the Project, IMD/ID decided to take over the procurement requirements of equipment for the project. Only a small amount of project procurement was procured by Sheladia; all the remaining items were procured by IMD/ID over the LOP.

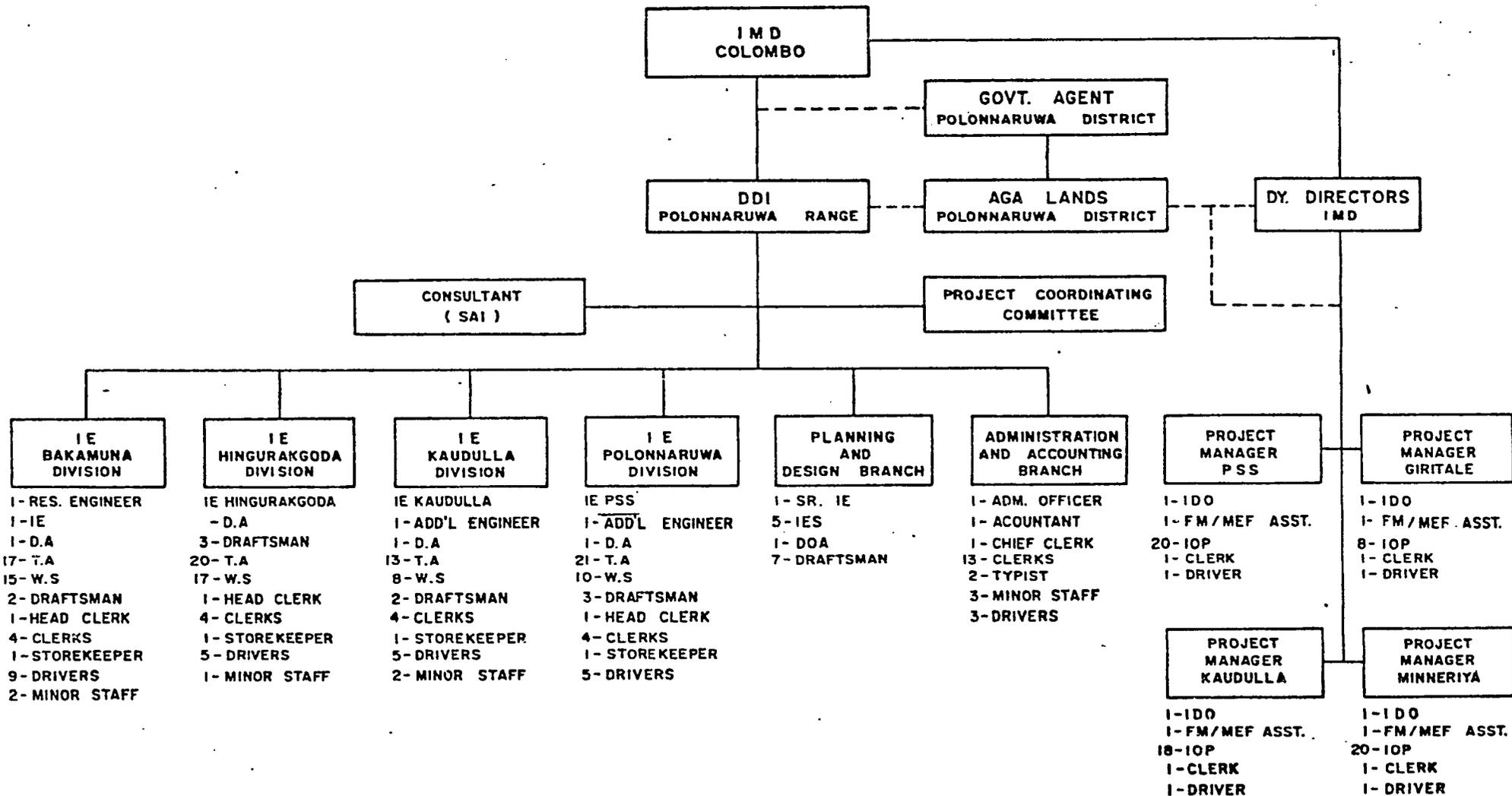
# ISMP

EXHIBIT 1-3-1

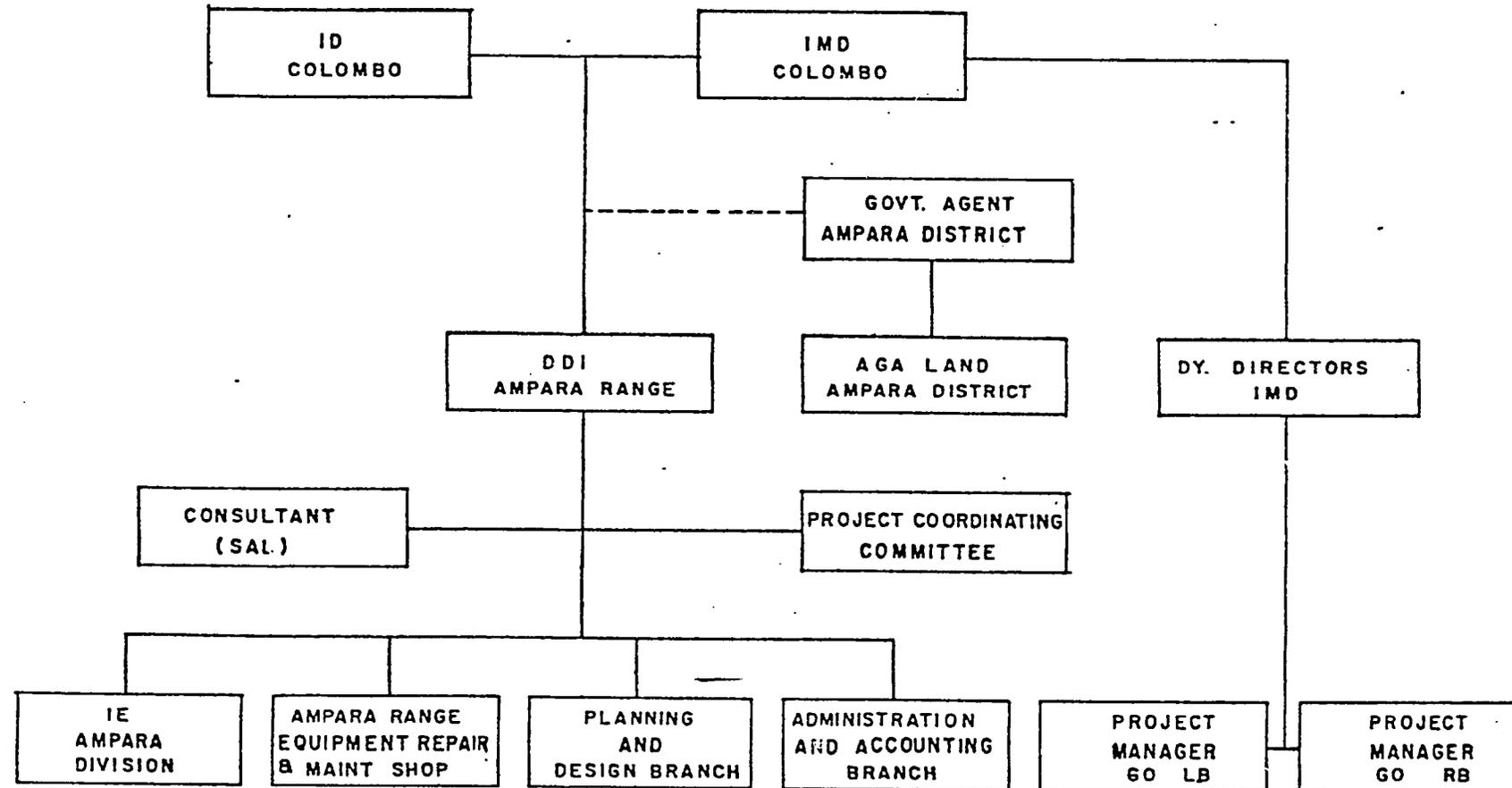
## GENERAL ORGANIZATION CHART



**ISMP**  
**ORGANIZATION CHART**  
**POLONNARUWA RANGE**



ISMP  
ORGANIZATION CHART  
AMPARA RANGE



1 - IE  
1 - DA  
19 - TAA  
11 - WSS  
1 - DRAFTSMAN  
1 - HEAD CLERK  
3 - CLERKS  
2 - STORE KEEPERS  
7 - DRIVERS  
5 - OPERATORS  
5 - MINOR STAFF

1 - ME  
1 - SK  
3 - CLERKS  
10 - MECHANICS  
2 - ELECTRICIANS  
2 - OPERATORS  
4 - WATCHERS  
2 - STORE LABOURERS  
1 - YARD LABOURER

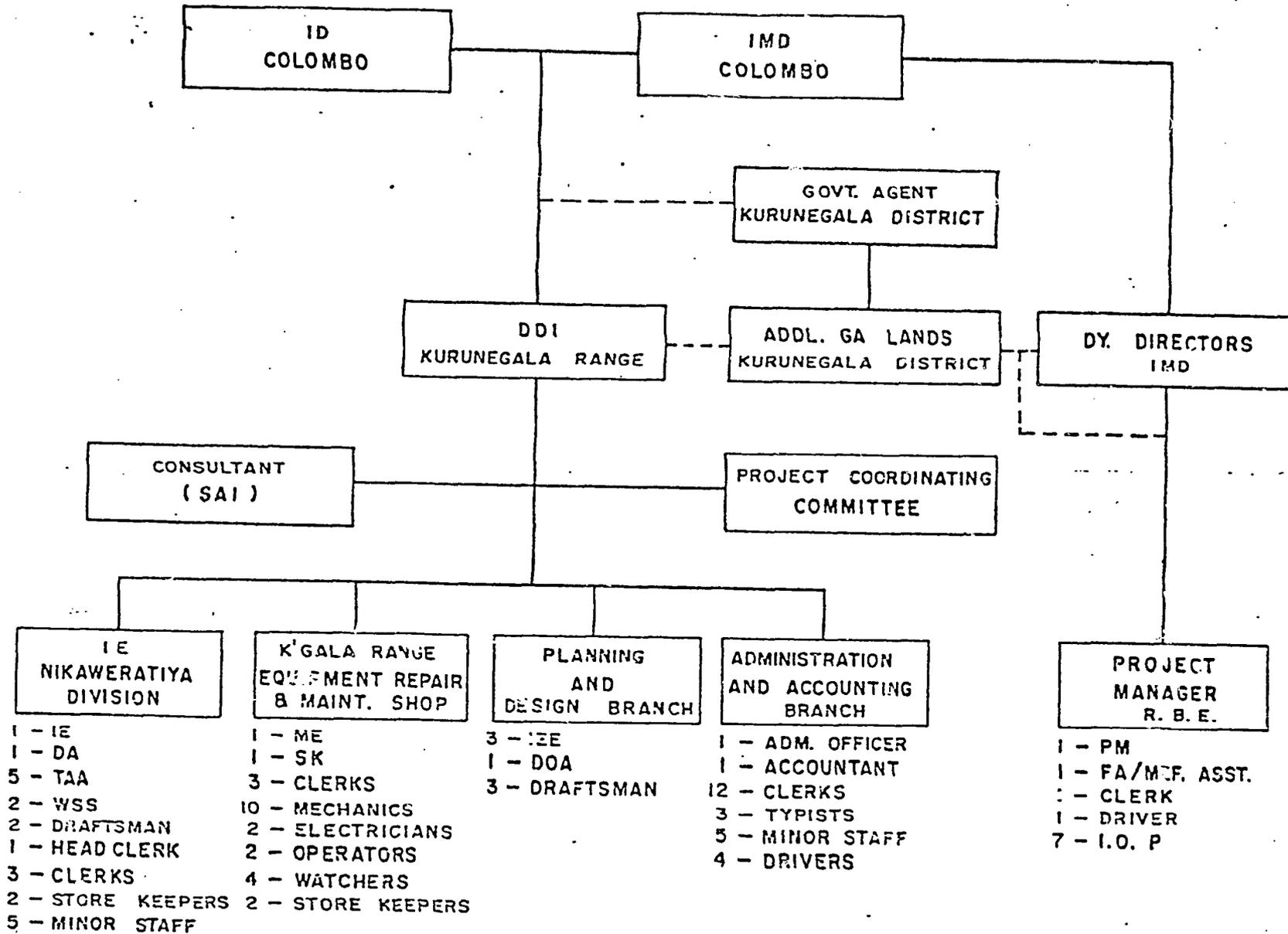
5 - IEE  
1 - ENG. ASST.  
1 - S. DRAFTSMAN  
3 DRAFTSMAN

1 - ADM. OFFICER  
1 - ACCOUNTANT  
7 CLERKS  
3 - TYPISTS  
5 - MINOR STAFF  
4 - DRIVERS

1 - PM  
2 - IDO  
1 - CLERK  
1 - DRIVER  
10 - IOP.

1 - PM

ISMP  
ORGANIZATION CHART  
KURUNEGALA RANGE



## II PROJECT IMPLEMENTATION OVERVIEW BY COMPONENTS

### 2.1 FARMER ORGANIZATION DEVELOPMENT

#### 2.1.1 Accomplishments

During the Project, major accomplishments were achieved under the Farmer Organization Development Program. These accomplishments were:

- o 2161 Field Canal Groups were formed in Parakrama Samudra Giritale, Minneriya, Kaudulla, Ridi Bendi Ela and Gal Oya LB and RB Schemes. Each Field Canal elects an individual who represents them at the DCFO.
- o 180 DCFOs were formed in the eight Schemes including Attaragallewa Scheme under the Bakamuna Division. The DCFOs have been accepted as formal organizations and their executive committee or board of management are comprised of all the Field Canal Representatives.
- o All Field Canal Representatives participate in an Assembly of DCFOs and they elect the executives of the System Level Farmer Organization. The System Level Farmer Organization is the apex organization in the Scheme and elected Field Canal Representatives work as Directors of the Board. Six System Level Farmer Organizations have been formed in Parakrama Samudra, Giritale, Minneriya, Kaudulla, RBE and Gal Oya LB Schemes.
- o The Farmer Organizations obtained legal recognition under the Agrarian Services (Amendment) Act No. 4 of 1991. 138 DCFOs are now registered with the Commissioner of Agrarian Services Department as of PACD.
- o The 152 DCFOs are actively engaged in the joint management process and are engaging the participatory management by taking over the operations and maintenance of the Distributary Canal Systems.
- o With the skills developed over the LOP by DCFOs undertaking construction contracts, the agencies involved have increased the contract value limit to DCFOs from Rs. 25,000 to Rs. 250,000 and finally increased it to Rs. 750,000.
- o Some 150 DCFOs have opened bank accounts in the State Banks and in the Cooperative Rural Bank in order to maintain their Development Funds. The DCFOs utilize this money in supplying agro-inputs to their members and for purchasing of agro-produce from the farmers. In addition to that they provide some funds for O&M of the system in accordance to the requirements of the Annual Maintenance Plan. This is happening in only a few DCFOs, where the Irrigation Sector Assistance Agreement. These DCFOs are given first preference to the allocation of O&M money for maintenance.

DCFO Name	No.	Date Formed	DCFO Legally Registered			Existence of Women's Handing Over		Official Handing Over Date	Colle-ction of O&M Fees	Exist-ence of Develop-ment Fund	Work Plans and Pre-accounts	Budgets and Accounts	Agri-Business Activi-ties	Annual Maint. Plans	Crop Div. Activit-y	Training			
			ID	IMD	CAS	A	B										(W/Y)	(N/Y)	
Puranagana INCP-574/PD/2/1	1	17-5-90	Y	Y	Y	Y	W	N	N	Y	42,350	Y	Y	Y	Y	Y	Y	Y	
Agbopura 577/PD/2/2	2	26-6-90	Y	Y	Y	Y	W	Y	N	Y	65,369	Y	Y	Y	Y	Y	Y	Y	
Mahasapura 577/PD/2/3	3	20-7-89	Y	Y	Y	Y	W	Y	N	Y	100,000	Y	Y	Y	Y	Y	Y	Y	
Jayantipura 577/PD/2/4	4	20-2-87	Y	Y	Y	Y	W	Y	N	Y	90,000	Y	Y	Y	Y	Y	Y	Y	
Kadawalawewa 577/PD/2/5	5	24-2-90	Y	Y	Y	Y	W	Y	N	Y	70,640	Y	Y	Y	Y	Y	Y	Y	
Unagalavehera 577/PD/2/6	6	17-10-86	Y	Y	Y	Y	W	Y	3-2-92	Y	75,000	Y	Y	Y	Y	Y	Y	Y	
Chandanapokuna 577/PD/2/7	7	19-3-88	Y	Y	Y	Y	W	Y	8-2-92	Y	36,000	Y	Y	Y	Y	Y	Y	Y	
Purana Muslim	8	16-4-91	Y	Y	N	N	N	N	N	Y	2,000	N	Y	N	N	N	Y	Y	Y
Perakua 573/PD/2/8	9	8-5-90	Y	Y	W	N	N	N	N	Y	41,749	Y	Y	Y	Y	Y	Y	Y	Y
Bendiwewa	10	22-6-90	Y	Y	Y	Y	W	N	N	Y	41,000	Y	Y	Y	Y	Y	Y	Y	Y
Nagapokuna 577/PD/2/9	11	1-6-90	Y	Y	Y	Y	W	Y	N	Y	84,093	Y	Y	Y	Y	Y	Y	Y	Y
46 DCO 577/PD/2/10	12	13-7-90	Y	Y	Y	N	N	N	N	Y	33,237	Y	Y	Y	Y	Y	Y	Y	Y

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DCFO Name	No. Formed	Date	DCFO Registered	ID	IND	CAS	Existence of Women's Youth Org (N/Y)	Official Handing Over Date	Colle-ction of O&M Fees	Exis- tence of Develop- ment Pre- pared	Work Budgets and Accounts	Agri- Business Activi- ties	Annual Plans Prepd.	Crop Div. Activit- Engaged	Training O&M/NEF/IO			
B EKSATH NCP/PO/581/3/14	1	31-12-88	Y	Y	Y	Y		18-2-92	Y	14,500	Y	Y	Y	Y	N	Y	Y	Y
RBI CP PURA PERAKUM NCP/PO/581/3/5	2	31-12-88	Y	Y	Y	Y			Y	50,000	Y	Y	Y	Y	Y	Y	Y	Y
DI KALINGA NCP/PO/581/3/4	3	31-12-88	Y	Y	Y	Y			Y	11,000	Y	Y	Y	Y	Y	Y	Y	Y
TRACT 2,3 MANDALAGIRI NCP/PO/581/3/2	4	31-12-88	Y	Y	Y	Y			Y	34,000	Y	Y	Y	Y	N			
TRACT 4,5 SUHADA EKSATH NCP/PO/581/3/3	5	31-12-88	Y	Y	Y	Y		18-2-92	Y	7,600	Y	Y	Y	Y	Y			
TRACT 6 SRI NAGA NCP/PO/581/3/18	6	31-12-88	Y	Y	Y	Y			Y	N	Y	Y	Y	Y				
TRACT 7 DS WIJITHA NCP/PO/581/3/15	7	1-10-90	Y	Y	Y	Y			Y	N	Y	Y	Y	Y				
TRACT 7 D4 WIJAYAFURA WIJAYA NCP/PO/581/3/13	8	1-10-90	Y	Y	Y	Y			Y	10,000	Y	Y	Y	Y				
TRACT 8 SAMAGI NCP/PO/581/3/9	9	31-12-88	Y	Y	Y	Y		18-2-92	Y		Y	Y	Y	Y				
TRACT 1 MENJHROWWA NCP/PO/581/3/12	10	31-12-88	Y	Y	Y	Y		18-2-92	Y	41,000	Y	Y	Y	Y				

STATUS OF FARMER ORGANIZATION DEVELOPMENT - KAUDULLA SCHEME. (Contd..)

Sheet 3 of 11

DCFO Name	No.	Date	DCFO Registered	ID	IMD	CAS	Existence of Youth Org	Official Handing Over	Colle-ction of O&M	Exis- tence of Develop. Plans	Work Plans and Pre- pared	Budgets (and Accounts)	Agri- Business Activi- ties	Annual Maint. Plans	Crop Div. Activit. Engaged	Training O&M/FW/REF	IO	
TRACT 2 SAMA	11	31-12-88	Y	Y	Y	Y	N	8-2-92	Y	48,000	Y	Y	Y	Y	Y	Y	Y	Y
NCP/P/581/3/21																		
TRACT 3 GOVISETA	12	31-12-88	Y	Y	Y	Y	N	8-2-92	Y	27,000	Y	Y	Y	Y	Y	Y	Y	Y
NCP/P/581/3/11																		
TRACT 4/1	13	31-12-88	Y	Y	Y	Y	N	8-2-92	Y	25,000	Y	Y	Y	Y	Y	Y	Y	Y
MAHINDAPURA																		
NCP/P/581/3/22																		
TRACT 4/2	14	31-12-88	Y	Y	Y	Y	N		Y	14,000	Y	Y	Y	Y	N	Y	Y	Y
PRAGATHI																		
NCP/P/581/3/16																		
TRACT 5 MAHAWELI	15	31-12-88	Y	Y	Y	Y	N		Y	7,500	Y	Y	Y	Y	N	Y	Y	Y
NCP/P/581/3/17																		
TRACT 6 PUBUDU	16	31-12-88	Y	Y	Y	Y	N		Y	100,400	Y	Y	Y	Y	Y	Y	Y	Y
NCP/P/581/3/8																		
TRACT 7	17	31-12-88	Y	Y	Y	Y	N		Y	27,000	Y	Y	Y	Y	N	Y	Y	Y
D.S.SENANAYAKE																		
NCP/P/581/3/1																		
TRACT SRI VIJAYA	18	31-12-88	Y	Y	Y	Y	N		Y	14,000	Y	Y	Y	Y	Y	Y	Y	Y
NCP/P/581/3/6																		
TRACT 9 MAHAZEN	19	31-12-88	Y	Y	Y	Y	N		Y	9,000	Y	Y	Y	Y	Y	Y	Y	Y
NCP/P/581/3/6																		
TRACT 10 EKSATH	20	31-12-88	Y	Y	Y	Y	N		Y	40,000	Y	Y	Y	Y	Y	Y	Y	Y
GOVI																		
NCP/P/581/3/20																		
TRACT 11 WEERA	21	31-12-88	Y	Y	Y	Y	N		Y	21,000	Y	Y	Y	Y	Y	Y	Y	Y
KEPPITIPOLA																		
NCP/581/P/3/19																		
TRACT 12 NAGARA	22	31-12-88	Y	Y	Y	Y	N	8-2-92	Y	45,000	Y	Y	Y	Y	Y	Y	Y	Y
PURA SAHANA																		
NCP/P/581/3/7																		

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STATUS OF FARMER ORGANIZATION DEVELOPMENT - MINNERIYA SCHEME.

Sheet 4 of 11

DCFO Name	No.	Date Formed	DCFO Registered	Legally Registered	Existence of Youth Org	Official Handing Over	Collection of D&M Fees	Existence of Development Fund	Work Plans Prepared	Budgets and Accounts	Agri-Business Activities	Annual Plans Prepd.	Crop Div. Engaged	Training	O&M	FM/NEFI	ID
RAJAELA 576/PO/4/5	1	1-2-86	Y	Y	Y	Y	W	Y	71,618	Y	Y	Y	Y	Y	Y	Y	Y
ULPATHWENA 576/PO/4/14	2	5-7-88	Y	Y	Y	Y	W	18-2-92	Y	81,266	Y	Y	Y	Y	Y	Y	Y
HATHAMUNA 576/PO/4/12	3	30-9-88	Y	Y	Y	Y	W	18-2-92	Y	41,500	Y	Y	Y	Y	Y	Y	Y
HINGURAKA 576/PO/4/18	4	1-3-86	Y	Y	Y	Y	W	Y	16,500	Y	Y	--	--	Y	Y	Y	Y
H'DAMANA 588/PO/4/3	5	25-3-86	Y	Y	Y	Y	W	Y	23,966	Y	Y	Y	Y	Y	Y	Y	Y
KUNARAGAMA 576/PO/4/15	6	3-2-86	Y	Y	Y	Y	W	Y	5,236	Y	Y	--	--	Y	Y	Y	Y
KOTIKAPITIYA	7	2-4-86	Y	Y	N	N	W	---	5,885	---	---	---	---	---	Y	Y	Y
YODA ELA 588/PO/4/2	8	29-3-86	Y	Y	Y	Y	W	18-2-92	Y	21,600	Y	Y	Y	Y	Y	Y	Y
YATIYALPOTHANA 576/PO/4/4	9	10-9-88	Y	Y	Y	Y	W	Y	11,500	Y	Y	--	--	Y	Y	Y	Y
KAUDULLA 588/PO/4/11	10	15-7-86	Y	Y	Y	Y	N	N	Y	6,430	Y	Y	Y	--	Y	Y	Y
SANSUNGAMA 588/PO/4/18	11	28-2-91	Y	Y	Y	Y	N	N	Y	13,562	Y	Y	--	Y	Y	Y	Y
KUSUMPOKUNA MAHASEN 581/PO/4/13	12	18-12-89	Y	Y	Y	Y	W	18-2-92	Y	51,684	Y	Y	Y	Y	Y	Y	Y

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STATUS OF FARMER ORGANIZATION DEVELOPMENT - MINNERIYA SCHEME. (Contd..)

Sheet 5 of 11

DCFD Name	No.	Formed	ID	IMD	CAS	(W/Y)	Date	Fees	Fund	Prepared	Accounts	Activities	Plans	Engaged	O&M	FM/MEF	IO
NAYA LUSUMPOKUNA	13	13-2-86	Y	Y	Y	Y	W		Y	13,334	Y	Y	Y	Y	Y	Y	Y
581/PO/4/17																	
DIYULANKADANA	14	10-8-88	Y	Y	Y	Y	W	18-2-92	Y	15,584	Y	Y	Y	Y	Y	Y	Y
581/PO/4/1																	
VIHARAMAVATHA	15	28-1-86	Y	Y	Y	Y	W	18-2-92	Y	67,223	Y	Y	Y	Y	Y	Y	Y
581/PO/4/6																	
GALAMUNA GEMUNU	16	18-1-86	Y	Y	Y	Y	--			6,481	Y	Y	Y	Y	Y	Y	Y
588/PO/4/7																	
GALAMUNA PERAKUMI	17	19-2-86	Y	Y	Y	Y	W			58,211	Y	Y	Y	Y	Y	Y	Y
588/PO/4/10																	
GALAMUNA NISSANKI	18	31-1-91	Y	Y	Y	Y	W			21,888	Y	Y	Y	Y	Y	Y	Y
588/PO/4/19																	
GALAMUNA VIJAYA	19	19-2-86	Y	Y	Y	Y	W			14,715	Y	Y	Y	Y	Y	Y	Y
588/PO/4/16																	
KOTALAMELA Jn.	20	38-3-86	Y	Y	Y	Y	W		Y	25,263	Y	Y	Y	Y	Y	Y	Y
576/PO/4/9																	

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74

STATUS OF FARMER ORGANIZATION DEVELOPMENT - PARAKRAMA SAMUDRA SCHEME.

Sheet 6 of 11

DCFO Name	No.	Date	DCFO Legally Registered		Existence of Womens Youth Org		Official Handing Over Date	Collection of O&M Fees	Existence of Development Fund	Work Plans Prepared	Budgets and Accounts Prepared	Agri-Business Activities	Annual Maintenance Plans Prepd.	Crop Div. Activities Engaged	Training O&M/MEF/IO
			A	B	(M/Y)	(M/Y)									
AKRANGANGA NCP/573/PO/1/12	1	1-5-84	Y	Y	Y		18-2-92	Y	42,148	Y	Y	Y	Y	Y	FM Y
ALUTHWEWA 573/PO/1/09	2	3-3-85	Y	Y	Y	W	18-2-92	Y	54,302	Y	Y	Y	Y	Y	FM Y
ELA MEDAGAMA 573/PO/1/20	3	16-10-85	Y	Y	Y	W	18-2-92	Y	24,882	Y	Y	Y	Y	Y	FM Y
LAKSHAUYANA 573/PO/1/25	4	17-9-85	Y	Y	Y		18-2-92	Y	12,305	Y	Y		Y		FM Y
MUSLIMJANAPADAYA 573/PO/1/19	5	10-4-86	Y	Y	Y	Y	18-2-92	Y	59,559	Y	Y	Y	Y		FM Y
TALPOTA BAUDHARTAGAMA 579/PO/1/11	6	1-1-84	Y	Y			18-2-92	Y	39,024	Y	Y	Y	Y	Y	FM Y
THAMBALA AL-HI-LAL PURA 579/PO/1/24	7	20-9-84	Y	Y	Y			Y	16,531	Y	Y	Y	Y	Y	FM Y
SOMAPURA ARAYAPURA 579/PO/1/01	8	18-11-85	Y	Y	Y	Y		Y	102,759	Y	Y	Y	Y	Y	FM Y
KEGALUGAMA 579/PO/1/13	9	19-2-88	Y	Y	Y	Y		Y	118,674	Y	Y	Y	Y	Y	FM Y
PULASTIGAMA 579/PO/1/05	10	10-9-85	Y	Y	Y			Y		Y	Y		Y	Y	FM Y
GENUNUPURA 579/PO/1/15	11	29-7-90	Y	Y	Y	W		Y	49,844	Y	Y	Y	Y	Y	FM Y
GALTHAMEARAWA 575/PO/1/02	12	7-6-85	Y	Y	Y			Y		Y	Y		Y	Y	FM Y
SEWAGAMA 575/PO/1/27	13	1-9-85	Y	Y	Y	Y		Y	33,688	Y	Y		Y	Y	FM Y
PALUGASDAMANA 576/PO/1/2	14	15-2-87	Y	Y				Y	48,308	Y	Y		Y	Y	FM Y



STATUS OF FARMER ORGANIZATION DEVELOPMENT - RIDI BENDI ELA SCHEME.

Sheet 8 of 11

DCFO Name	No.	Date Formed	DCFO Legally Registered	ID	IMD	CAS	Distance of Youth Org	Official Handing Over	Collection Date	Existence of O&M	Work Plans	Budgets and Accounts	Agri-Business Activities	Annual Maint. Plans	Crop Div. Activities	Training	O&M/HEF/IO	
KATAGOMUWA	1	14-7-90	Y	Y						Y	26,640	Y	Y	N	Y	Y	Y	Y
MAGALLEGAMA	2	12-6-90	Y	Y				18-2-92	Y	21,525	Y	Y	Y	Y	Y	N	Y	Y
IBBAWELA NWP/K/17/3/3	3	30-7-91	Y	Y	Y			18-2-92	Y	40,546	Y	Y	N	Y	Y	Y	Y	Y
MEDAELA K/17/3/4	4	11-6-90	Y	Y	Y	W		18-2-92	Y	25,785	Y	Y	N	Y	Y	Y	Y	Y
BALAGOLLAGAMA	5	25-1-91	Y	Y		W			Y	39,718	Y	Y	Y	Y	Y	Y	Y	Y
BUDUNUTTAWA	6	27-3-90	Y	Y	Y				Y	20,892	Y	Y	N	Y	Y	Y	Y	Y
KEBELLAWA K/17/03/01	7	28-8-90	Y	Y					Y	13,865	Y	Y	Y	Y	Y	Y	Y	Y
HEELOGAMA K/17/03/02	8	24-3-90	Y	Y	Y				Y	18,690	Y	Y	Y	Y	Y	Y	Y	Y
DIVALLEWA	9	26-10-91	Y	Y					Y	27,648	Y	Y	N	Y	Y	Y	Y	Y
DANDUWAMA	10	9-7-90	Y	Y					Y	8,221	Y	Y	Y	Y	Y	Y	Y	Y
THAFANAGOLLA	11	3-7-90	Y	Y					Y	68,647	Y	Y	N	Y	Y	Y	Y	Y

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STATUS OF FARMER ORGANIZATION DEVELOPMENT - GAL OYA LB SYSTEM.

DCFO Name	No. Formed	Date Registered	DCFO Legally Registered	Existence of Women's Org	Official Handing Over	Collec- tion of O&M	Exis- tance of Develop. Pre- pared	Work Plans and Accounts	Budgets and Activi- ties	Annual Business Plans	Crop Maint. Div. Activit. Engaged	Training	O&M/FM/NEF/IO				
LB 1A BATAHIRA	1	18-7-88	Y	Y	Y	No	23-1-91	Y	3,435	N	N	N	N	N	N	N	
DUNGALA	2	4-9-86	Y	Y	Y	No	23-1--1	Y	3,077	Y	Y	Y	Y	N	Y	Y	Y
LB1, 2, & 3	3	27-7-86	Y	Y	Y	No	30-3-90	Y	4,382	Y	Y	Y	Y	N	Y	Y	Y
LB 4	4	19-2--1	N	Y	N	No		N	3,115	N	Y	N	N	N	N	N	N
LB5	5	7-9-86	Y	Y	Y	No	14-11-90	Y	12,047	Y	Y	Y	Y	Y	Y	Y	Y
LB 6	6	15-12-86	Y	Y	Y	No		N	11,295	N	Y	Y	N	N	Y	Y	Y
LB 7 (upper)	7	20-2-86	Y	Y	Y	No		N	13,162	N	Y	Y	N	N	Y	Y	Y
LB 7 (lower)	8	20-7-86	N	Y	Y	No		N	4,279	N	Y	N	N	N	N	N	N
LB 8	9	1-6-87	Y	Y	Y	No	1-4-89	N	3,411	N	Y	N	N	N	N	N	N
LB 10	10	18-3-87	Y	Y	Y	W	30-3-90	Y	3,095	N	Y	Y	N	N	N	N	N
LB 11A & B	11	31-7-87	Y	Y	Y	No	30-3-90	Y	6,025	Y	Y	Y	Y	Y	N	N	N
LB 12	12	22-7-90	Y	Y	Y	No	23-1-91	Y	1,617	N	N	N	N	N	N	N	N
LB 14	13	25-5-85	Y	Y	Y	No	30-3-90	Y	4,485	N	N	N	N	W	N	N	N
LB 15	14	25-5-85	Y	Y	Y	W	30-3-90	Y	3,339	N	Y	N	N	N	N	N	N
LB 16	15	25-5-85	Y	Y	Y	W	30-3-90	Y	3,540	N	Y	N	N	N	N	N	N
UB 1	16	25-5-85	Y	Y	Y	W	1-4-89	Y	8,955	Y	Y	N	Y	N	Y	Y	Y
UB 2	17	Mar. 81	Y	Y	Y	No	30-3-90	Y	16,608	Y	Y	N	Y	N	Y	Y	Y
5A & 5B	18	Mar 84	Y	Y	Y	No	30-3-90	Y	11,249	N	Y	Y	N	N	N	N	N
UB 7	19	26-7-85	Y	Y	Y	No		Y	19,195	Y	Y	Y	Y	N	Y	Y	Y
UB 8 & 8A	20	10-6-85	Y	Y	Y	No	13-3-91	Y	9,818	Y	Y	Y	Y	N	Y	Y	Y
UB 9 & 10	21	2-2-81	Y	Y	Y	No	30-3-90	Y	32,810	Y	Y	Y	Y	N	Y	Y	Y
UB 11	22	20-6-85	Y	Y	Y	No	14-11-90	N	3,266	N	Y	Y	N	N	Y	Y	Y
UB 12	23	24-6-84	Y	Y	Y	No		N	18,365	N	Y	Y	N	N	N	N	N
UB 13,14,15 & 16	24	30-3-86	Y	Y	Y	Y	1-4-89	Y	9,697	N	Y	Y	N	N	N	N	N
UB 17	25	4-1-90	N	Y	Y	No		N	7,255	N	Y	Y	N	N	N	N	N
H 01	26	3-10-84	Y	Y	Y	No	14-11-90	Y	10,043	N	Y	Y	N	N	Y	Y	Y

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DCFO Name	No.	Formed	ID	IND	CAS	DCFO Legally Registered	Existence of Womens	Official Handing Over	Colle-ction of O&M	Exis-tence of Develop.	Work Plans	Budgets	Agri-Business	Annual Maint.	Crop Div.	Training	
						Date	(W/Y)	Date	Fees	Fund	pared	Prepared	ities	Prepd.	Engaged	O&M/FM/MEF/IO	
M 2,3, & 4	127	12-6-90	Y	Y	Y	No			N	3,391	N	Y	Y	N	N	N	N
M 5	128	20-9-90	Y	Y	Y	No			N	7,187	N	Y	N	N	N	N	N
M 5.2	129	1984	Y	Y	Y	No	27-5-92		N	9,167	M	Y	Y	N	N	N	N
M 5.4	130	15-1-81	Y	Y	Y	No	1-4-89		Y	2,538	N	Y	N	N	N	N	N
M 6.7	131	10-8-82	Y	Y	Y	No	14-11-90		Y	9,800	N	Y	Y	N	N	N	N
M 8	132	10-3-82	Y	Y	Y	No	10-3-90		Y	10,890	N	Y	Y	N	Y	Y	Y
M 9, 11	133	10-10-87	Y	Y	Y	No	1-4-89		Y	9,026	N						
M 12	134	14-5-83	Y	Y	Y	No	1-4-89		Y	10,060	N						
M 16	135	10-9-89	Y	Y	Y	No	10-3-90		Y	7,053	N						
M17 & 20	136	11-9-90	Y	Y	Y	No			N	3,518	N						
LB - 19 & 20	137	10-1-85	Y	Y	Y	No	14-11-90		Y	11,700	N						
LB 21 & 22	138	17-12-85	Y	Y	Y	No	23-1-91		N	20,086	N						
LB 23,24 & 25	139	12-12-90	Y	Y	Y	No	23-3-91		T	11,783	N						
LB29,30,31,32,61	140	16-1-85	Y	Y	Y	No	13-3-91		Y	13,747	Y						
163	141	17-2-85	Y	Y	Y	No	10-3-91		Y	5,687	Y						
165	142	16-10-85	Y	Y	Y	No	10-3-90		Y	8,504	Y						
166	143	15-11-85	Y	Y	Y	No	14-11-90		N	8,740	Y						
16 4 & 7	144	17-10-85	Y	Y	Y	No	13-3-90		N	14,078	N						
16 10	145	20-7-85	Y	Y	Y	No	13-3-90		N	16,742	N						
16 2 & LB 27	146	12-10-90	Y	Y	Y	No	13-3-90		N	5,581	N						
16 11	147	124-6-91	Y	Y	N	No	13-3-90		N	3,885	N						
16 9 to 16	148	20-10-85	Y	Y	Y	No	23-1-91		Y	6,521	N						
PERAKUM	149	27-7-87	Y	Y	Y	No	1-4-89		Y	5,850	N						
PADDANGALAYAYA	150	14-1-91	Y	Y	N	No			N	4,613	N						
RUHUNUGAMA	151	14-1-91	Y	Y	N	No			N	10,519	N						
LB 34 to 36	152	14-8-91	Y	Y	N	No	18-6-92		N	9,457	N						
LB 37 to 39	153	15-7-91	Y	Y	N	No	18-6-92		N	7,562	N						
LB 40 to 42	154	18-7-91	Y	Y	N	No	18-6-92		N	2,100	N						
SENAGAMA	155	12-9-91	N	Y	N	No			N	2,290	N						
PAMPARA YAYA	156	10-9-87	Y	Y	N	No			N	2,450	N						

DCFO Name	No. Formed	Date	DCFO Registered	ID	IND	CAS	(W/Y)	Date	Fees	Fund	Work Budgets	Agri- Business	Annual Maint.	Crop Div.	Training
IRB1-6	1														
IRB7,8,11,61&2	2														
IRB 3,4, & TAIL															
IRB GALMADU Br	3														
IRV-1 to 9	4														
IRV 10 - 19	5														
IRB1A-16 & 16A &															
IRB DAMANA Br CHL	6														
IRB 20	7														
IRI 1 to 4	8														
IRWG 1 to 9	9														
IRWG 10 to 12	10														
IRWG13 to 18&TAIL															
IRB END OF WG	11														
IRB23, 26&27	12														
IRILLUKKUCHENAI	13														
IRNEETHAI	14														
IRPK 1 to 8	15														
IRPK 9 to 12 & 14	16														
IRPK 13, 15 to 19	17														
IRPK20 to 31	18														
IRB 31	19														
IRTA 1 to 17	20														
IRB 35A to 36A	21														
IRAF 1 to 5	22														
IRAK 6 to 8	23														
IRAK 9	24														
IRAK 10	25														
IRB 24,25,29,30	26														
IRB 32	27														
IRVR 1 to 7	28														
IRVR 7 to 13	29														
IRKL 6, 8 to 13	30														
IRB 35	31														
IRSK44&L14 to 18	32														
IRKL 19 to 23	33														
IRKL 24 to 30															
IRSK 5 to 13															
IRSK 14 to 18															

STSFOD

- o The 22 DCFOs of Kaudulla Scheme have obtained bank credit from the Regional Rural Development Bank to purchase agro-chemicals and fertilizer to distribute among the members of the DCFO in 1991 Maha season.
- o Seventeen DCFOs were engaged in marketing activities in Minneriya, Kaudulla and Ridi Bendi Ela Schemes during the 1991/92 Maha season and they maintained the guaranteed price all over the ISMP areas.
- o Five DCFOs are eligible to establish paddy mills in Kaudulla and Minneriya Schemes in July 1992. The loans have been approved by the National Development Bank and legal documents have to be sign before 30th June 1992.

### 2.1.2 Innovative Strategies Adapted.

The strategies developed and followed in Gal Oya Water Management Project and INMAS Program was accepted and followed in the ISMP Farmer Organization Development Program. Some innovative strategies adopted under ISMP are discussed below:

- o Instead of Sub-Project Committee (SPC) ISMP re-named the FOs as DCO/DCFOS to be in line with the hydraulic boundary concept formulated by INMAS.
- o All farmers using water from the Distributary Canal, irrespective of their tenurial status, are entitled to membership in the DCFOs.
- o All Farmer Group Representatives form the Executive Committee of DCFOs. This committee elects their office bearers by secret ballot.
- o All Farmer Group Representatives in each Scheme represent the electoral college and they elect the office bearers of the SLFO for the coming year in accordance with the constitution.
- o DCFOs developed Development Funds and deposited those funds at the State Banks and Rural Banks.
- o DCFOs started the Seed Producers Associations under the umbrella of the DCFOs in RBE and Gal Oya LB. The Department of Agriculture and USAID funded a Seed Enterprise Development Project and, gave necessary assistance, in the forming of the Seed Producers Associations.
- o Many DCFOs engaged in the supply of agro-inputs to the member farmers at a cheaper rate than the open market price. The DCFOs utilized Development Fund money in purchasing agro-inputs. Some DCFOs have obtained credit from the RRDB to buy fertilizer and agro chemicals.

- o In 1991/92 Maha 8 DCFOs of Minneriya and 8 DCFOs of Kaudulla engaged in marketing activities. They buy back the agricultural produce from the farmers in collaboration with the Regional Rural Development Bank.
- o Some DCFOs in Minneriya Scheme re-paid loans to release the lands which were mortgaged for their members needs. The DCFO with the assistance of the Colonization Officer summoned both parties and came to an agreement to settle the loan in instalments and they hand over the land to the original owner/occupier to commence the farming work in the field.
- o To keep the strength and togetherness among the DCFOs and farmers, SLFOs have organized religious and cultural events.
- o Formation of women and youth organizations under the umbrella of the DCFO is a major innovation in the history of Farmer Organization Development in Sri Lanka .
- o The Minneriya SLFO officials had discussions with the National Development Bank to obtaining credit facilities for installing a few paddy mills in Kaudulla and Minneriya Schemes. They expect to produce quality rice and send it to market in packet form to get the value-added price to them. This request has been honored by the NDB and they will sign the legal documents in June 1992 to commence the milling operations in the Yala '92 harvest.

### 2.1.3 Successes and Shortcomings

The FOs introduced a different approach in NGOs implementation of the bottom up approach. The existing organizations, rural development societies and most of the organizations followed the top bottom approach from FC group to DCFO to SLFO to project management committee. Following the bottom up approach FOs were in a better position to solve the problems pertaining to farmers. The farmer representatives discuss the problems with the farmer parties concerned and try to effect an agreeable solution. When conflicts cannot be resolved at FC level, such as, cultivation of reservation, inadequate water etc., they are then referred to the DCFO under these three tier structure of farmer organization, the membership allowed all farmers using water from the D-canal, irrespective of their tenurial status, would be entitled to become members of the DCFO.

The importance of equitable water distribution is accepted and member farmers maintained the field canals and D-canals in sound manner participating the joint management with the ID officials. The process of participatory management was introduced to the farmers to enhance the level of their competence in decision making and action oriented programs. The SLFO officials represent the District Agricultural Committees in the Kachcheri and four Presidents of the SLFOs in the Polonnaruwa District participate in the Steering Committee Meetings of the Mahaweli Water Panel, at the Ministry of Lands Irrigation and Mahaweli development.

The recruitment of IOs to perform the role of catalyst in the development of the FO program has been successful under the ISMP. It has extended to the other major irrigation schemes in Sri Lanka.

The farmers have developed a spirit of togetherness among themselves and they participate collectively in the preparation of crop production plans, annual budgets and annual maintenance plans for the DCFO and the SLFO. Out of 180 DCFOs formed to date under the ISMP, 33 DCFOs have already signed the Agreement to take over the maintenance and operation of the distributory canals. In signing this agreement, the farmers have realised that they now have to maintain the irrigation system and the D and F canals. This is a tremendous achievement if all D and F canals have been maintained in a satisfactory manner. Unfortunately many of the D canals have not yet been rehabilitated at PACD and are still in a deteriorated state. As a result of this, some DCFO officials are hesitant to take over these canals from the ID, insisting that the rehabilitation works should be completed before they do so.

The DCFOs have initiated the Development Funds and they utilize this money to purchase agro-inputs and buy back the farm produce.

The DCFOs became legal entities under the Agrarian Services (Amendment) Act No. 4 of 1991. DCFOs have negotiated credit facilities from banks that will allow them to start new enterprises, such as paddy milling and agro-processing industries.

The Forming of women's organisations under the purview of DCFOs is a major success under the ISMP. The organisations strengthen the DCFOs and also take a part in DCFO activities. Women are also exploring the possibilities of self employment projects to increase the farm family income.

In most of the DCFOs, the powers, privileges and responsibilities are exercised by the President and should be delegated to the other farmer representatives in order to create working committees in their DCFOs. This will reduce much of the dependency on the President while the farmer would share the duties and responsibilities among themselves.

Some of the IOs should be promoted to the position of Development Advisors and should be provided the necessary training in MEF, FM and agro-business activities. They must then guide the DCFOs in implementing the new venture and upkeep the MEF/FM activities on a continuous basis.

#### 2.1.4 Status of FO Development at PACD

The ISM Project has been instrumental in strengthening the Government's commitment to increased farmer participation in the decision and making and planning process. Integrating technical and institutional development and institutional development and institutionalizing participatory management. The FO was specifically formed to address the problems of farmer participation

in the improvement and management of irrigation systems, assessment and collection of membership fees and the interaction of the organization of water users with local authorities and Government Irrigation Agencies. Table 2.1-1 presents the status of FO development by scheme at PACD.

Registration with Agrarian Services is a two step process. Initial registration is under Section 56-A. After assessment of DCFO performance. CAS moves them to Section 56-B and the DCFO is able to obtain credit. Since the development of FOs under the ISMP has been so positive, proper, legal recognition by the Government would enable the organizations to carry out their daily functions such as OM, amongst others.

TABLE 2-1-1

STATUS OF FARMER ORGANIZATIONS UNDER ISMP

SYSTEMS	FCGs		DCFOs			Registration				
	formed	To be formed	Formed	To be formed	Area Councils	SLFO	ID	IMD	CAS	
PSS	317	--	28	--	4	1	28	28	A27	B14
Giritale	164	--	12	--	--	1	12	12	A10	B08
Minneriya	277	--	20	--	4	1	20	20	A19	B16
Kaudulla	360	--	22	--	4	1	22	22	A22	B22
RBE(K'gala)	200	--	11	--	--	1	11	11	A04	--
Galoya LB	509	--	56	--	4	1	55	55	A55	--
Galoya KB	306	154	30	--	--	--	15	--	--	--
A/Gallewa	06	--	01	--	--	--	01	01	A01	--
-----										
	2198	154	180	--	16	6	164	149	138	60
=====										

it is accepted fact that there is a need to improve water management through farmers mobilisation, participation and organization. This has to continue forever in order to seek a viable healthy farmer organization marching towards the self-reliance goal.

AT PACD some 45 FOs will have officially taken over their Distributory canals system for OM from the Irrigation Department by signing the Agreement for hand-over. The remaining DCFOs in the ISMP will sign this hand-over agreement after completion of the rehabilitation.

- o In implementing the FO program the interrelationship between the Project Manager Office IEs, office and farmer organizations, is very important. There should be a close collaboration and mutual understanding in all the project activities, between them.
- o All water users have to become members of the DCFOs and they should comply with and obey the constitution and by-laws of the organization. All water users should participate in OM

activities and they must pay the membership fees stipulated by the organization.

- o The question of water fees against membership has not yet been resolved. We recommend that FO who have undertaken OM activities, should be exempted from all government fees.
- o The self-reliant organisations area of sustainability and the FOs will diversify their activities in various directions in order to achieve their goals of increased farm family income.

## 2.2 OPERATION AND MAINTENANCE IMPROVEMENT

### 2.2.1 ACCOMPLISHMENTS

#### 2.2.1.1 REHABILITATION OF THE IRRIGATION SYSTEMS

Considerable accomplishments were achieved in the rehabilitation of the Schemes within the ISMP. A major Project achievement was the involvement of the D-Canal Organizations (DCOs) in rehabilitation as well as in Operation and Maintenance.

In the Polonnaruwa Range, by the end of March 1992, of the, 1550 km. of canals programmed, about 659 km have been rehabilitated. The scheduled and actual Progress for ESI works is presented as Exhibit 2-2-1 and the Status of Survey, Design and Construction of each of the five Schemes in the Polonnaruwa Range, including the Attaragallewa Scheme is presented as Table 2-2-1.

In the Ridi Bendi Ela Scheme in the Kurunegala Range, construction of water measurement devices, Priority rehabilitation works and the rehabilitation of the Inlet Canal have been undertaken. By the end of March 1992, the first phase of the construction of Water Measurement devices was completed. 100% while the Priority Rehabilitation works was 95% completed and the Rehabilitation of the Inlet Canal was 15% completed. The physical and Financial status for the construction of Water Measurement devices, Priority Rehabilitation and rehabilitation of the Inlet Canal in the RBE Scheme is presented in Table 2-2-2.

The Pragmatic Rehabilitation Works Program in Gal Oya RBMC suffered delays due to the prevailing ground conditions in the area. As of the end of March 1992, out of the 621 km. of canals programmed only about 53.70 km. was rehabilitated. The Planned Program and Actual Progress for the Pragmatic Rehabilitation Works in the Gal Oya RBMC is presented as Exhibit 2-2-2 and the Status of Survey, Design and Construction on the GORB system and the Preventative Maintenance work in the GOLB system in Ampara Range are presented in Table 2-2-3 and Table 2-2-2-4 respectively.

Monitoring and certification inspections for reimbursement of expenditures for completed and partially completed Sub-Projects within the seven Schemes within the ISMP area was also undertaken. A summary of the 168 Sub-Projects listed are: 61 as 100%; 25 as 75%; 50 as more than 50% complete and 32 Sub-Projects found to be less than 50% complete or not yet started. The summary of the Status of Sub-Project Certification by Range as of 31 March, 1992 is presented as Exhibit 2-2-3.

#### 2.2.1.2 DEVELOPMENT OF A PREVENTATIVE MAINTENANCE PROGRAM

The accomplishments on the Preventative Maintenance Program up to 30 June 1992 are presented by Range. In the Polonnaruwa Range, the Annual Maintenance Plan was prepared for the Main System

facilitates that were rehabilitated since 1987, for each of the four Schemes.

#### ACCOMPLISHMENTS IN POLONNARUWA RANGE

Major accomplishments were achieved in the development of the preventive maintenance program in the Polonnaruwa Range.

##### A. ANNUAL MAINTENANCE PLAN - MAIN SYSTEM

The Annual Maintenance Plans for the Main Systems of the Parakrama Samudra, Minneriya, Giritale and Kaudulla Schemes were developed and completed and the average Annual Maintenance Costs for these four Schemes was found to be about Rs., 125/-.

##### B. ANNUAL MAINTENANCE PLANS - DISTRIBUTARY SYSTEM

There are 81 DCOs in the four Schemes of the Polonnaruwa Range. The Annual Maintenance Plans for all the 81 DCOs were essentially completed. In the Giritale Scheme, completed the annual maintenance plans for all the 12 DCOs and submitted detailed reports to the ID/IMD. Typical annual maintenance plan requirements for the Distributary Canal System were also prepared.

For the remaining 69 DCOs the walk-through maintenance surveys, cost estimates, maintenance plans and issue trees have been prepared and completed. Translations of the maintenance plans in Sinhala had been accomplished for all the DCOs that officially took over the D-Canals from the ID on 3 February 1992. Exhibit 2-2-4 presents the status of DCO maintenance plans in the four Schemes in Polonnaruwa Range. The average cost of the Annual Maintenance for the 81 DCOs in Polonnaruwa Range was found to be Rs. 220/Ac.

#### ACCOMPLISHMENTS IN KURUNEGALA RANGE

##### A. ANNUAL MAINTENANCE PLAN - MAIN SYSTEM

The preparation of the Annual Maintenance Plans and related documents of the RBE Scheme Main System was completed. Based upon the Annual Maintenance Costs developed under the Annual Maintenance Plan for the Main System, the average cost per acre was found to be Rs. 339/-. This figure is high because of the maintenance cost of the 20 km long Inlet Canal which serves the Scheme.

##### B. ANNUAL MAINTENANCE PLAN - DISTRIBUTARY SYSTEM

There are eleven DCOs in the Ridi Bendi Ela Scheme. As of 30

June 1992, the Annual Maintenance Plans, Cost Estimates, Water Distribution Diagram (Issue Trees) for all eleven DCOs have been completed.

The preparation of the Maintenance Diagram based upon updated BOPs were being developed as of 30 June 1992. Sinhala translations of five of the Annual Maintenance Plans have been completed. The average Annual Maintenance Cost for the eleven DCOs was found to be Rs. 130/Ac. for the Distributary and Field Canals.

#### C. PREVENTATIVE MAINTENANCE PROGRAM

The Ridi Bendi Ela Scheme in Kurunegala Range was rehabilitated between 1978 - 1983 and the system has deteriorated during the intervening period, so a program of Preventative Maintenance works was initiated in 1989. These works are being carried out in the LB, RB and Center Canal systems. The status of the Preventative Maintenance works on the RBE Scheme as of 30 June 1992, is shown on Table III-2-5 of T.A. Cerdan's End of Tour Report.

#### ACCOMPLISHMENTS IN AMPARA RANGE

##### A. ANNUAL MAINTENANCE PLAN - MAIN SYSTEM

Under the Gal Oya Left bank Scheme, the development of the Annual Maintenance Plan for the Main System was completed and finalized by 30 March 1992. The Annual Maintenance Cost for the Left Bank Main System was found to be Rs. 107.50/Ac. The progress on the development of the Annual Maintenance Plan for the Main System of the Gal Oya Right Bank was completed by 30 June 1992. By 31 March 1992, the Walk-Through Maintenance Survey and Cost Estimates and other related documents were completed for the RB Main Canal from Station 0+000 to Station 35+208. Work on the Walk-Through Survey for the intermediate tanks and ten Branch Canals totalling 90 km. was initiated in April and completed by 31 May, 1992. The Annual Maintenance Cost of the Main System for the Gal Oya Right Bank System was found to be Rs. 206.22/Ac.

##### B. ANNUAL MAINTENANCE PLAN - DISTRIBUTARY SYSTEM

The preparation of the Annual Maintenance Plans for the 54 DCOs on the Left Bank and the 36 DCOs on the Right Bank were in progress as of 30 June 1992. As of that date, only field work in 34 of the 54 DCOs on the Left Bank have been surveyed and only 11 of the 36 DCOs in the Right Bank surveyed.

Only in one DCO on the Left Bank has the complete Annual Maintenance Plan been finalized as of PACD. This was prepared by Sheladia's Ampara Engineering Assistant for use by the ID as a guide for completing the Annual Maintenance Plans for the remaining DCOs.

## C. PREVENTATIVE MAINTENANCE PROGRAM - GAL OYA LB

The Gal Oya LB was rehabilitated between 1980 - 1985. The system has deteriorated during the intervening period, so a program of Preventative Maintenance works was initiated under the ISMP in 1989. Table 11-2-8 of T.A. Cerdan's End of Tour Report presents the Status of Preventative Maintenance work at the Gal Oya Left Bank System.

### 2.2.1.3 IMPROVEMENT TO IRRIGATION SYSTEMS OPERATION

The implementation of the Action Plan set up at the inception of the Project to improve operations under the ISMP was undertaken. As of 30 June 1992, most of the programs under the Action Plan have been implemented.

- A. Five Field Operations Units (FOU) for the Giritale Scheme and three in the RBE Scheme have been established. In the Kaudulla Scheme, the location of the four FOU's have been identified. In Minneriya, Parakrama Samudra, Gal Oya RB and Gal Oya LB systems, the existing FOU are being utilized but these have to be up-graded to the Giritale and RBE standards.
- B. The original plan was to use two-way (walkie-talkie) communication systems to transmit data from FOU's to Division Operation Centres, but due to local conditions in some parts of country, the plan was dropped and instead the use of bicycles and telephones where available are being used.
- C. Control and Issue Trees / Schematic Water Distributary Diagrams showing the location of control, monitoring and outflow / inflow points have already been prepared for all the Schemes. The boundaries of the coverage of each DCO have been demarcated and the code number for the monitor, inflow and outflow nodes have been indicated.
- D. Rain gauges have been installed in all the Schemes within the ISMP area. In the Giritale and RB Schemes, rain gauges are installed in the vicinity of the FOU offices to ensure that daily gauge readings are taken and collected daily from the FOU offices by the Gauge readers assigned to collect field data which are fed into the Computer Assisted Systems Operations Model (CASOM) everyday.
- E. The location and type of water measurement devices for the Main and Branch Canals identified during walk-through operations surveys, carried out in the Schemes within the Polonnaruwa Range and the Ridi Bendi Ela Scheme in the Kurunegala Range have been established. The location of measuring devices at the boundaries of DCO's in all the seven Schemes within the ISMP area have already been identified. Those established are in Giritale, Kaudulla High Level Canal and Ridi Bendi Ela Scheme.

In the other Schemes some measuring devices have been established while the others that are already in place will have to be improved and provided or replaced with the new plastic gauges.

- F. Headgates or Distributary Canals have been provided by screw type sliding steel gates to control the flow of water into the D-Canals. Measuring devices in distributary canals have been located and established. Most of these measurement structures are installed near the headgate of the D-Canals where the flow is already stable or no longer turbulent. Where the drop in water surface is sufficient to warrant free flow condition, a cut throat flume is usually constructed.
- G. To control the flow of water to field canals, pipe outlets were constructed at off-takes of F-Canals. Wooden gates with provision for locking are provided. These canals will be calibrated once a year with the use of a portable cut throat flume which rates will be used as data to be entered in to CASOM.
- H. In the Giritale Scheme the calibration of all the 76 measuring points identified have been completed. In the Kaudulla Scheme High Level Canal 15 out of 28 points have been calibrated while in Ridi Bendi Ela Scheme in the Kurunegala Range 25 measuring points have been calibrated and is continuing. In the other Schemes calibration of measuring devices is still on-going. Assessment of canal losses is still going on in all the Schemes.
- I. A meteorological Station was set up in Polonnaruwa for monitoring rainfall, sunshine, temperature, wind, humidity, etc. This station had been the source of data used in programming the CASOM. The data being recorded and compiled could be used to forecast weather condition in the area which could be used in pre-seasonal planning for the on-coming cultivation season.
- J. Computers have been installed at the Range Operation Center at the DDI Polonnaruwa Range Office. In the Division Operation Centres for the Hingurakgoda and Kaudulla Divisions in the Polonnaruwa Range and in Nikaweratiya Division, Kurunegala Range, computers have also been installed. In Ampara a new Computer was also installed to replace the old computer being used in that Scheme. The three computer models previously developed have been installed in all these computers.
- K. The TAs trained in the use of the micro-computers for water management were assigned to head the Division Operation Centres and the Irrigation Engineers were assigned to head the Range Operation Centres and to coordinate the utilization of the CASOM in the Division Operation Centres within the Range. The CASOM in Giritale was utilized during Yala Season 1991 and Maha Season 1991 - 1992.

Some problems have been encountered in the use of the CASOM. In the sorting of nodes, the monitor nodes could not be inserted where they are supposed to be inserted without undesirable effects on the screen. This and other problems encountered and some suggestions for the refinement of the model were transmitted to Dr. Gary P. Merkley who has since rectified the problem.

- L. In the assessment of the operations cost for the Main System in the Giritala Scheme, a TA was considered as working full time on operations activities. He supervises all the activities of the operation phase of O&M including the operation of the Division Operation Center and the Field Operation Units. He is supported by TAs, WSSs and PLs assigned to the various FOU's.

In the assessment where salaries of TAs was included, the estimated cost was about Rs. 75 per acre. If the salaries of the TAs was excluded the cost would be only about Rs. 63 per acre. The Irrigation Department provides funds for the salaries of work supervisors and permanent laborers. If these items are excluded the operations cost would decrease further.

In the assessment of the operations cost for the Distributary Canal System, a DCO Water Master (Jalapalaka) was considered to be working full time for 8 months during a year and should be compensated as such. He is also allotted a bicycle allowance so he could be mobile. FCRs assisting him should also be compensated. With these considerations the estimated cost for operations in the D-Canal System would be about Rs. 32 per acre. The computation of the operations cost was detailed in Exhibit III-3-11 of T.A. Cerdan's End of Tour Report.

#### 2.2.2 INNOVATIVE STRATEGIES ADOPTED

There were four major innovative strategies adopted during the LOP to improve the implementation of the O&O Component. These four strategies are summarized as follows:

- o One of the most important innovative strategy implemented under the O&M Component was the participatory management of the ID/IMD and farmers in the O&M program. Both in maintenance and operation the farmer accompanied the ID staff in the walk-through surveys to determine the maintenance and operation requirements for project implementation. Also in the process of identifying the rehabilitation requirements for the D and F canals the TA staff discussed the rehabilitation program with the farmers before making final plans, estimates and costs. Furthermore when DCFOs took rehabilitation contracts on their D and F canals the ID Technical Assistant staff assisted them by providing construction management and construction practice advice and provided them with training in quality control of construction.

All of those participatory management efforts on the part of ID/IMD and Farmer Organization was a major break through and achievement in the sustainability of the DCFOs.

- o To accomplish the Annual Maintenance Plans for the 7 Main Systems and for the 201 Distributary Canal System and to implement the improvements to Systems Operation over the LOP it was necessary to devise a means to collect the data necessary for implementation of those requirement in an efficient manner. To solve this problem, the Consultant implemented the walk-through survey of the canal systems for both maintenance requirements and operation requirements. Initially for the Main System these two survey were conducted simultaneously in order to reduce the time necessary for walking all the Main and Branch Canals under each system. The Annual Maintenance Plans for all seven Main Schemes were completed before PACD and for 92 of the 201 DCFOs under the Project. Only the 109 DCOs in the Gal Oya RB and LB were remaining to be completed at PACD. In System Operations the walk-through survey identified the location of water measurement gages; the location and type of new control and water measurement structures and the use of existing structure wherever possible for measurement.

The survey also determined the water measurement requirements for measuring the amount of water at the boundaries between DCUs. As of PACD two Schemes, Giritale and Kaudulla, have all the planned water measurements facilities in place based upon the data collected during these walk-through surveys. In Ridi Bendi Ela Scheme in Kurunegala Range 95% of all water measurement structures were in place and calibrated Only in Parakrama Samudra, Minneriya and Gal Oya RB do installation of gauges and construction of structures remain to be accomplished at PACD.

- o Training in Water Management, ME&F and In-Service Training to PM, IDOs, IOs, TAs, WSS, MEF/FM Assistants and Farmers were accomplished by utilizing the practical ground root approach for training rather than the modern theoretical approach as outlined in the Mid-Term Evaluation Report. Success in the ISMP Training Program must be given to this strategy as programs initiate by people who knew the practical approach was the way to succeed on the ISMP. In other Projects, where theoretical training was is imposed little result were achieved, however, under ISMP results from this practical training concept was a major breakthrough that enhanced Project implementation considerably. The people who did this training were:

Professor G.V. Skogaboe - Water Measurement/Calibration

Dr. G. Merkly - Computer Assisted W.M. Module Training

Dr. K. Smith/W. Ellawala - MEF Program Training

J. McCallum/H.A. Premaratna - In-Service Training for:

- TAs, WSSs, - 130 people
- Institutional Organizers - 85 people
- Field Canal Representatives - 250 people
- PM and MEF/FM Assistants - 16 people
- Training of Trainers TAs - 20 people

The training provided by the above Short-Term Consultants was instrumental in the success and the implementation of the O&M, FO Development, MEF and FM Components under ISMP.

- o A computer program for the ISMP Schemes was developed and utilized in water management operations. This program is less complicated than the model developed for the Gal Oya Left Bank System in the Ampara Range. All the parameters used to compute the water requirements for the various activities in agricultural production and the different crop stages are entered in the model. By entering the node (water measurement point) gauge height, rainfall and cropping data the computer outputs the volume of water passing through each node. Based on the programmed water management index the system operators will know if more or less water is passing through each node, which should be jointly field verified by the TA and the DCO water master (Jalapalaka) concerned and then make the necessary adjustments in the flow.

At the end of the cropping season a Seasonal Water Report and a Reservoir Operations Report will be prepared for use in planing operations for the next cropping season. The development of these three water management models is a major achievement to meeting the Project goal of better water management for increased agricultural production.

### 2.2.3 SUCCESS AND SHORT-COMINGS

#### 2.2.3.1 Successes under O&M Component

There were several successful O&M accomplishments over the LOP. These successful accomplishments are noted hereafter.

- o The development of the Annual Maintenance Plans for the Main Irrigation System and for the Distributary Canal System was a major achievement under the Project. The Annual Maintenance Plans for all seven Schemes in the Project were completed by PACD and for the 92 DCFOs in the Parakrama Samudra, Giritale, Minneriya, Kaudulla and Ridi Bendi Ela Schemes. Only in Gal Oya LB and RB has the preparation of the DCFO Annual Maintenance Plans remain to be accomplished at PACD.

The success of the Preventative Maintenance Program, which is to be implemented after PACD, will be directly influence by these Annual Maintenance Plans developed over the LOP. If adequate funds are provided by the GOSL for the Main Irrigation Plans the Preventative Maintenance Program will be

a success. Furthermore if the DCFO Annual Maintenance Plans are funded and implemented by the farmers with the assistance of the ID TA staff the long term sustainability of those Distributary Canal Systems will be achieved.

- o The development of the Computer Assisted Water Management Model was a major achievement, however, its success in assisting the ID and the DCFOs in better Water Management for a more equitable distribution of water remain to be seen at PACD.
- o The setting up of the Scheme Water Management Cells, Organization and Infrastructures to implement the improved System Operations and Water Management was a success, however, the implementation of the program remains to be fully accomplished at PACD.
- o Training to TAs, Ws, MEF/FM Assistants, IDOs and Field Canal Representatives in O&M, MEF and FM was a success.

#### 2.2.3.2 Short-Comings Under the O&M Component

There were a two major short-coming under the O&M Component; they are noted below:

- o The short-coming with the greatest impact on the achievement of Project Goals and objectives was the termination of the Project at PACD rather than extension of the Project for two years as recommended in the Mid-Term Evaluation Report. By terminating the Project at PACD the sustainability of the Preventative Maintenance Program and Improved System Operation Program can not be assured as they will not have been implemented or tested for even one year. With a two year extension these programs could have been implemented and tested in all Schemes. Further more the Preventative Maintenance Program for the DCFOs in Gal Oya RB an LB were not completed as of PACD and the implementation of the 92 DCFO Annual Maintenance Plans for the Polonnaruwa and Kurunegala Schemes had yet to be implemented at PACD.
- o Another major short-coming under the O&M Component was the non achievement of the rehabilitation program. Although the rehabilitation in the Gal Oya Systems started two years late, progress there was interrupted many times from mid-1989 to PACD so that only about 10% of the planned work was completed in Ampara Range by 30 June 1992. In Polonnaruwa Range about 675 km were rehabilitated out of 1600 km planned or about 42% as of PACD with the overall percent complete for the two Ranges of only 33%.

Even in the best of circumstances over a 5 year LOP only about 65% of the 2222 km planned could have realistically been achieved. Therefore there was a major mis-calculation in project implementation planning in the Project Paper.

As of 30 June 1992, the Annual Maintenance Plan and related documents for the Ridi Bendi Ela Scheme Main System has been completed. The Annual Maintenance Cost for these work is Rs. 2,223,363 or Rs. 339/Acre.

**B. ANNUAL MAINTENANCE PLAN - DISTRIBUTARY SYSTEM**

As of 30 June 1992 the Annual Maintenance Plans and related documents for the eleven DCOs in the RBE Scheme have been completed. Sinhala translations of these documents will be prepared by the ID before the official hand over of the D-Canals to the DCOs.

**C. PREVENTATIVE MAINTENANCE (PRIORITY REHABILITATION)**

As stated earlier, considerable work in this Scheme remains to be accomplished on Sub-Projects for which PILs have been established by USAID. Only Sub-Projects 4 and 17 have been certified 100% complete and the remaining 15 Sub-Projects are in various levels of completion ranging from 07% to 86.0%. The outstanding work involved is Rs. 9,514,537 as of 30 June 1992.

**STATUS OF PREVENTATIVE MAINTENANCE - AMPARA RANGE**

**A. ANNUAL MAINTENANCE PLANS - MAIN SYSTEM**

As of 30 June 1992, the Annual Maintenance Plans and related documents have been completed for both Gal Oya Rb and LB Main Systems. The Annual Maintenance Cost for the Gal Oya LB was found to be Rs. 6,636,937 (Rs. 107.5/Ac.) and for the Gal Oya RB Rs. 7,109,189 (Rs. 206.22/Ac.).

**B. ANNUAL MAINTENANCE PLANS - DISTRIBUTARY CANAL SYSTEM**

Considerable work remains to be done in order to complete the Annual Maintenance Plans for the 36 DCOs in the Gal Oya RB and the 54 DCOs in the Gal Oya LB as of 30 June 1992. Walk-Through Maintenance Survey, preparation of Quantity and Cost Estimates, preparation of Annual Maintenance Plans, preparation of Maintenance Diagrams and the translation of these documents into Sinhala or Tamil have yet to be undertaken.

As of 30 June 1992, only the field work for the above activities has been accomplished in 10 out of the 36 DCOs in the Right Bank and 34 out of 54 DCOs in the Left Bank. ID should complete the Walk-Through Maintenance Survey for the remaining DCOs so that the Annual Maintenance Plans can be completed.

**C. PREVENTATIVE MAINTENANCE PROGRAM - GAL OYA LB**

Under the Preventative Maintenance Program for the Gal Oya Left Bank System, six Sub-Projects have been started. Five of the six Sub-Projects have been certified between 56 to 81%

complete. Only one Sub-Project SP No. 4 has not been certified completed as only about 35% of the work under that Sub-Project has been completed.

#### 2.2.4.3 STATUS OF IMPROVEMENTS TO IRRIGATION SYSTEMS OPERATION

Rehabilitation in the Irrigation Systems Management Project was undertaken hand-in-hand with the implementation of the Action Plan for water management operations programs. The Action Plan could not be fully achieved due to the low priority given to water management improvement programs. The installation of measuring devices started moving only after the Irrigation Sector Assistance Agreement between the GOSL and USAID was finalized, but the implementation was slow. The existing Field Operation Units in the Minneriya Scheme and in the Parakrama Samudra Scheme have yet to be improved and provided with the same visual aids and lay-out maps displayed in the FOU's in Giritale, RBE and Kaudulla.

The detailed procedure for the collection of field data to be transmitted to the Division Operation Center based on the prepared Water Management Operations Charts for the Kaudulla, PSS and RBE have not yet been prepared.

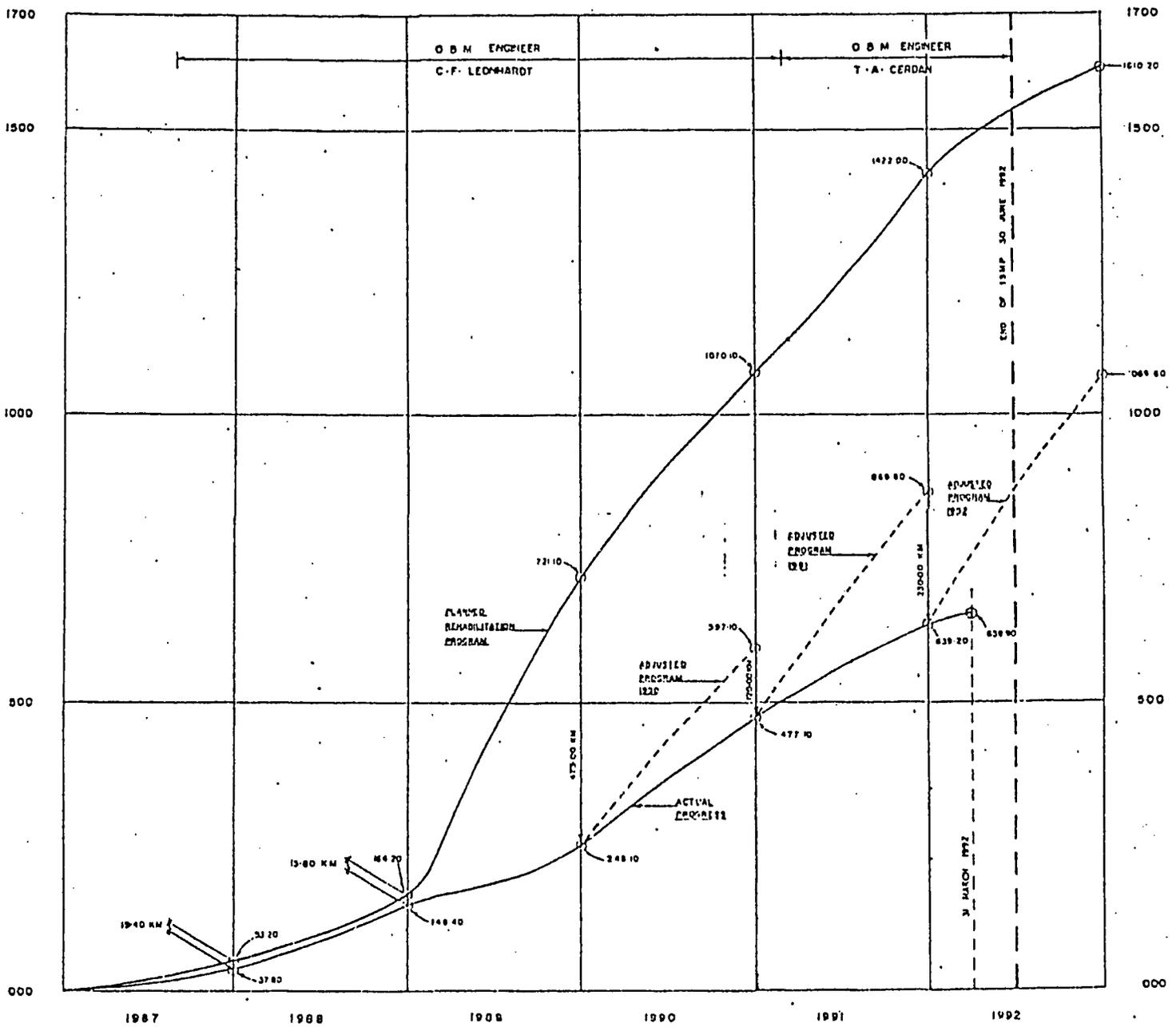
The control and measuring devices in the main and branch canals in the Parakrama Samudra, Kaudulla Low Level Canal, Minneriya and GORB Schemes have not yet been improved and provided with plastic gauges. The location of additional measuring points identified at the boundaries of DCOs have been identified, but not yet established and calibrated and discharge curves/tables prepared.

Establishment of control and measuring devices and assessment of canal losses in the distributary canals in the Low Level Canal in the Kaudulla Scheme, Parakrama Samudra Scheme, Minneriya Scheme and in the Gal Oya Right Bank System have yet to be undertaken. Likewise, the calibration of these measuring devices must be undertaken as soon as they are installed.

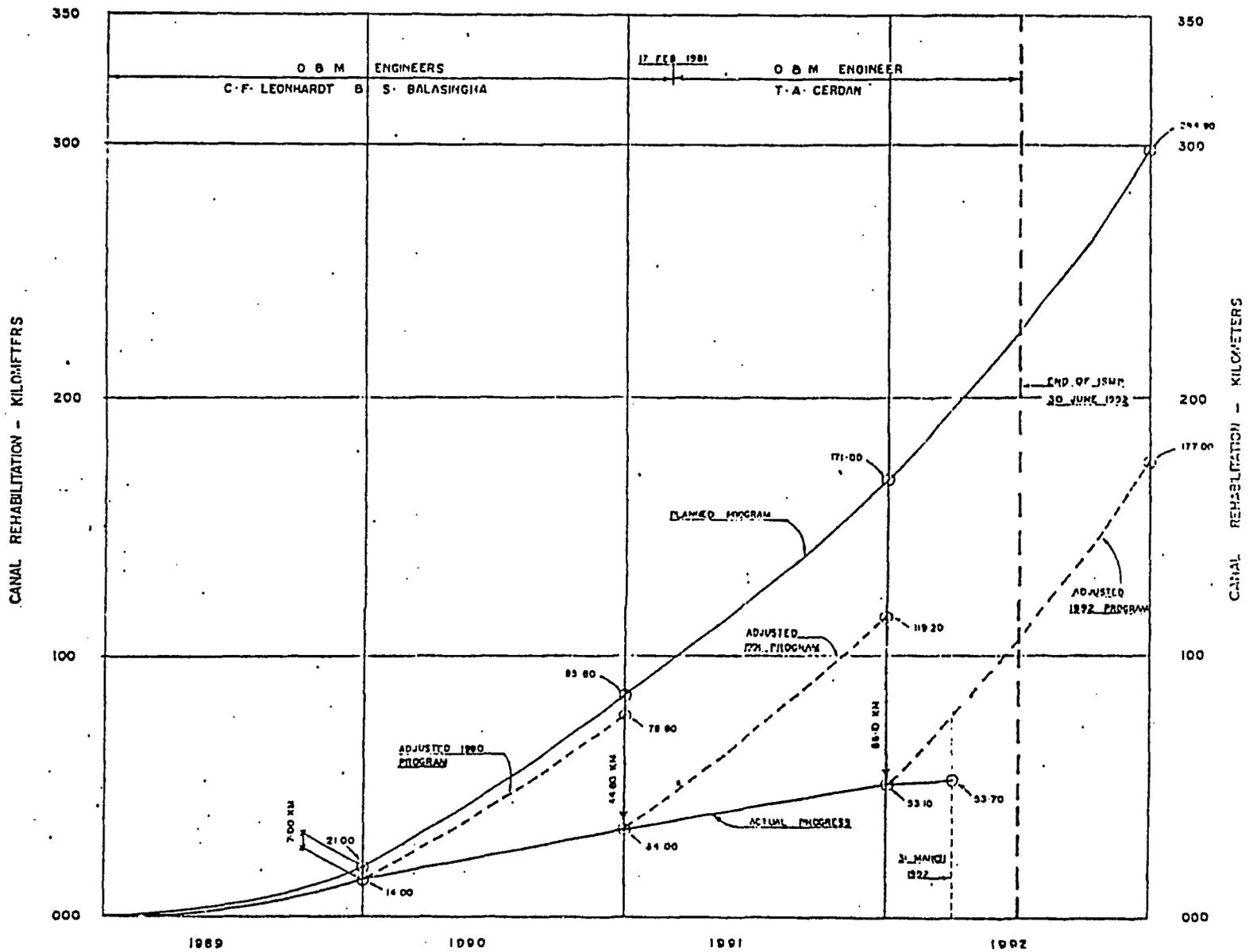
The CASOM in all the Schemes except Giritale and Gal Oya Left Bank System had not yet been utilized for Water Management Operations. In the Gal Oya Scheme, although the program for the new model has been installed in the recently acquired Computer, the printer for the old computer is not compatible with the new computer, so they cannot use the program.

In RBE, Kaudulla, PSS and Minneriya Schemes, they have not yet started gathering field data to be used in the CASOM installed in their computers. The computers in the Division Operation Centres usually break down and some computer accessories from the Range Operation Centres have to be transferred to the Division Operation Centres to replace the computer accessories that broke down. As a result, the preparation of the Seasonal Water Reports and the Reservoir Operation Reports is delayed. These reports should be prepared immediately after each cropping season so they can be analyzed and used in programming the next seasons cropping activities.

IRRIGATION SYSTEMS MANAGEMENT PROJECT  
 POLONNABUWA RANGE  
 REHABILITATION WORK PROGRAM 1987-1992  
 SCHEDULED AND ACTUAL PROGRESS



IRRIGATION SYSTEMS MANAGEMENT PROJECT  
AMPARA RANGE  
PRAGMATIC REHABILITATION WORKS GAL OYA RBMC  
1989 TO 1992  
PLANNED PROGRAM & ACTUAL PROGRESS



SUMMARY BY RANGE  
STATUS OF SUB-PROJECT CERTIFICATION  
(31 MARCH 1992)

EXHIBIT 2.2-3

Sheet 1 of 2

SCHEME	YEAR	SUB-PROJ. 100%			SUB-PROJECTS 75-100%			SUB-PROJECTS 50-75%			SUB-PROJ. 0-50%			TOTAL SUB-PROJECTS		
		No.	REIMB. (Rs.)	REMAIN.	No.	REIMB. (Rs.)	REMAIN.	No.	REIMB. (Rs.)	REMAIN.	No.	REIMB. (Rs.)	REMAIN.	No.	REIMB. (Rs.)	REMAIN.
PSS	1987	6	6,133,575	--	--	--	--	--	--	--	--	--	6	6,133,575	--	
PSS	1988	6	5,219,160	1	330,750	110,250	2	1,189,750	854,894	--	--	--	9	6,739,668	965,144	
PSS	1989	6	3,266,455	2	1,072,513	375,504	9	4,098,836	2,626,029	2	593,115	--	19	8,437,804	3,594,648	
PSS	1990	4	712,305	--	--	--	1	237,783	219,492	1	191,000	--	6	950,168	410,492	
TOTALS		22	15,331,575	3	1,403,263	485,754	12	5,526,377	3,700,415	3	784,115	--	40	22,261,215	4,970,284	
GIRITALE	1987	1	1,413,000	--	--	--	--	--	--	--	--	--	1	1,413,000	--	
GIRITALE	1988	3	2,870,950	--	--	--	1	534,440	345,020	--	--	--	4	2,613,390	346,020	
GIRITALE	1989	1	312,360	--	--	--	6	2,854,831	2,129,183	1	410,030	--	8	3,167,191	2,547,221	
GIRITALE	1990	--	--	--	--	--	--	--	--	1	131,990	--	1	--	131,990	
TOTALS		5	3,804,310	--	--	--	7	3,389,271	2,475,203	2	550,020	--	14	7,193,581	3,025,231	
MINNERIYA	1987	3	4,725,000	--	--	--	--	--	--	--	--	--	3	4,725,000	--	
MINNERIYA	1988	5	5,800,300	1	416,870	138,690	3	1,189,292	679,841	1	244,516	--	10	6,605,662	1,063,047	
MINNERIYA	1989	4	4,355,320	5	3,342,347	1,107,117	2	1,176,291	457,280	4	4,145,220	--	15	8,873,958	5,709,617	
MINNERIYA	1990	1	230,155	2	1,278,142	426,849	1	520,160	491,832	3	1,737,230	--	7	2,028,465	2,655,111	
TOTALS		13	14,310,775	8	5,036,559	1,671,856	6	2,805,751	1,628,953	8	6,126,966	--	35	22,233,005	9,427,775	

STASPCR

SUMMARY BY RANGE  
STATUS OF SUB-PROJECT CERTIFICATION  
(31 MARCH 1992)

EXHIBIT 2.2-3  
Sheet 2 of 2

SCHEME	YEAR	SUB-PROJ. 100%			SUB-PROJECTS 75-100%			SUB-PROJECTS 50-75%			SUB-PROJ. 0-50%			TOTAL SUB-PROJECTS		
		No.	REIMB. (Rs.)		No.	REIMB. (Rs.)	REMAIN. (Rs.)	No.	REIMB. (Rs.)	REMAIN. (Rs.)	No.	REIMB. (Rs.)	REMAIN. (Rs.)	No.	REIMB. (Rs.)	REMAIN. (Rs.)
KAUDULLA	1987	2	2,843,125										2	2,843,125		
KAUDULLA	1988	5	2,741,111	2	1,558,507	519,502	1	222,088	162,813	1	468,911		9	4,521,786	1,151,226	
KAUDULLA	1989	2	2224565	4	2,635,881	796,443	4	1,888,864	858,142	1	962,712		11	6,668,510	2,617,297	
KAUDULLA	1990	4	2,361,874	2	1,150,588	383,526				4	1,469,648		10	3,512,454	1,853,166	
		13	10,178,675	8	5,344,968	1,699,471	5	2,830,152	1,828,955	6	2,901,263		32	17,545,795	5,621,689	
SUB TOTAL PLN RA:		53	43,617,335	19	11,784,798	3,857,881	13	13,831,551	10,825,526	19	18,362,372		121	69,233,676	23,844,979	
IRIDI BEND	1989			1	167,825	55,675	2	672,841	392,859				3	839,866	447,734	
ELA	1990	1	134,615	4	3,893,635	986,548	3	1,242,757	469,585	6	7,698,758		14	4,471,807	10,128,683	
SUB TOTAL KNG RA:		1	134,615	5	3,268,668	962,215	5	1,915,598	861,564	6	7,698,758		17	5,310,873	10,576,337	
GAL OYA R	1989	7	7,881,645				11	6,583,817	4,047,796	6	5,746,466		24	13,585,462	9,794,262	
GAL OYA L	1989			1	262,485	87,469	4	1,649,273	952,887	1	425,363		6	1,911,678	1,465,639	
SUB TOTAL AMP RA:		7	7,881,645	1	262,485	87,469	15	8,153,090	5,000,683	7	6,171,829		30	15,497,140	11,259,901	

STASPCR

ANNUAL MAINTENANCE PLAN & COST ESTIMATES  
TERTIARY SYSTEMS - PSS  
( 30 JUNE 1992)

EXHIBIT 2.2-4  
Sheet 1 of 4

DCO No	NAME OF DCO	FIELD WORK %	COST EST %	MAINT PLAN %	ISSUE TREE %	BOP %	Sinhala Trans.
1	AMBANGANGA	100	100	100	100	0	100
2	ALUTHWEWA	100	100	100	100	0	100
3	D - 4 CHL	100	100	100	100	0	100
4	LAXAUAYANA	100	100	100	100	0	0
5	MANIKKAMPATTIYA	100	100	100	100	0	100
6	TALPOTHA	100	100	100	100	0	100
7	THAMBALA(ALHILALPURA)	100	100	100	100	0	0
8	SOMAWATHIYA	100	100	100	100	0	0
9	KEGALUGAMA	100	100	100	100	0	0
10	PULASTIGAMA	100	100	100	100	0	0
11	GEMUNUPURA	100	100	100	100	0	0
12	GALTHAMBARAWA	100	100	100	100	0	0
13	SEWAGAMA	100	100	100	100	0	0
14	PALUGASDAMAWA	100	100	100	100	0	0
15	MONARATENNA	100	100	100	100	0	0
16	VIJAYARAJAPURA	100	100	100	100	0	100
17	SINHARAJAPURA	100	100	100	100	0	0
18	PAHALAKALINGAELA	100	100	100	100	0	0
19	SUNGAWILA/MOHIDEEN	100	100	100	100	0	0
20	WEERAPURA	100	100	100	100	0	100
21	KALAHAGALA	100	100	100	100	0	0
22	DAMANA GEMUNUPURA	100	100	100	100	0	0
23	SINHAPURA	100	100	100	100	0	0
24	VIJAYABAPURA	100	100	100	100	0	0
25	LANKAPURA	100	100	100	100	0	100
26	WEERA FEDESA	100	100	100	100	0	100
27	2 CHL/WEERAPARAKRAMA	100	100	100	100	0	100
28	MAHASEN	100	100	100	100	0	0

AMPCETS

ANNUAL MAINTENANCE PLANS & COST ESTIMATES  
TERTIARY SYSTEMS - MINNERIYA  
30 JUNE 1992

EXHIBIT 2.2-4  
Sheet 2 of 4

DCO No.	NAME OF DCO	FIELD WORK %	COST EST %	MAINT PLAN %	ISSUE TREE %	BOP %	Sinhala Trans.
1	Raja Ela	100	100	100	100	0	0
2	Kotalawela	100	100	100	100	0	0
3	Hinguraka	100	100	100	100	0	0
4	Kumaragama	100	100	100	100	0	0
5	Hingurakdamana	100	100	100	100	0	0
6	Kotigahapitiya	---	---	---	---	---	---
7	Kaudulla	100	100	100	100	0	0
8	Galamuna Gamunu	100	100	100	100	0	0
9	Galamuna Perakum	100	100	100	100	0	0
10	Galamuna Wijaya	100	100	100	100	0	0
11	Yoda Ela	100	100	100	100	0	100
12	Kusumpokuna	100	100	100	100	0	0
13	Viharamawatha	100	100	100	100	0	100
14	Yatigalpothana	100	100	100	100	0	0
15	Hathamuna	100	100	100	100	0	100
16	Ulpathwewa	100	100	100	100	0	100
17	Divulankadawela	100	100	100	100	0	100
18	Mahasen	100	100	100	100	0	100
19	Govt. Farm	---	---	---	---	---	---
20	Nissanka	100	100	100	100	0	0
21	Sansungana	100	100	100	100	0	0

ANNUAL MAINTENANCE PLANS & COST ESTIMATES  
TERTIARY SYSTEMS - GIRITALE  
( 30 JUNE 1992)

EXHIBIT 2.2-4  
Sheet 3 of 4

No.	NAME OF DCO	FIELD WORK %	COST EST %	MAINT PLAN %	ISSUE TREE %	BOP %	Sinhala Transla
1	PURANAGAMA	100	100	100	100	100	0
2	AGBO	100	100	100	100	100	0
3	MAHASEN	100	100	100	100	100	0
4	JAYANTHIPURA	100	100	100	100	100	0
5	KADAWALA WEWA	100	100	100	100	100	100
6	UNAGALAWEHERA	100	100	100	100	100	0
7	CHANDANAPOKUNA	100	100	100	100	100	100
8	PURANA MUSLIM	100	100	100	100	100	0
9	PARAKUM	100	100	100	100	100	0
10	BENDIWEWA	100	100	100	100	100	0
11	NAGAPOKUNA (PULASTI)	100	100	100	100	100	0
12	HATASISATA	100	100	100	100	100	0

AMPCETS

ANNUAL MAINTENANCE PLANS AND COST ESTIMATES      EXHIBIT 2.2-4  
 TERTIARY SYSTEMS - KAUDULLA      Sheet 4 of 4  
 ( 30. JUNE . 1992 )

DCO No	NAME OF DCO	FIELD WORK %	COST EST %	MAINT PLAN %	ISSUE TREE %	BOP. %	Sinjiala Trans.
1	EKSATH	100	100	100	100	0	100
2	MENIK HOROWWA	100	100	100	100	0	100
3	SAMA	100	100	100	100	0	100
4	GOVISETHA	100	100	100	100	0	100
5	MANDALAGIRI	100	100	100	100	0	0
6	KALINGA, ELA	100	100	100	100	0	0
7	C.P PURA PERAKUM	100	100	100	100	0	0
8	PUBUDU	100	100	100	100	0	0
9	SUHADA EKSATH	100	100	100	100	0	100
10	SRI NAGA	100	100	100	100	0	0
11	VIJAYAPURA VIJAYA	100	100	100	100	0	0
12	SAMAGI	100	100	100	100	0	100
13	MAHINDAPURA	100	100	100	100	0	100
14	MAHAWELI	100	100	100	100	0	0
15	D.S. SENANAYAKE	100	100	100	100	0	0
16	SRI VIJAYA	100	100	100	100	0	0
17	WEERA KEPPETIPOLA	100	100	100	100	0	0
18	NAGARAPURA SAHANA	100	100	100	100	0	100
19	MAHASAN	100	100	100	100	0	0
20	EKSATHGOVI	100	100	100	100	0	0
21	VIJITHA	100	100	100	100	0	0
22	PRAGATHI	100	100	100	100	0	0

IRRIGATION SYSTEMS MANAGEMENT PROJECT - POLONNARUWA RANGE  
MONITORING SURVEYS, DESIGNS AND CONSTRUCTION  
OF

TABLE 2.2-1

PARAKRAMA SAMUDRA, MINNERIYA, GIRITALE, PAUDULLA, BAKAMUNA -  
ATTAFAGALLEWA SCHEMES - AS OF 31 MARCH 1992

CANAL	TOTAL LENGTH (km)	COMPLETED AS OF 31 MARCH 1992			REMAINING FOR 1992 PROGRAM			REMAINING FOR LIFE OF PROJECT		
		SURVEY	DESIGN	CONST.	SURVEY	DESIGN	CONST.	SURVEY	DESIGN	CONST.
PSS	27.74	27.74	27.74	19.74	--	--	8.00	--	--	--
MIN	15.00	15.00	15.00	15.00	--	--	--	--	--	--
M.C. GIR	5.60	1.60	1.60	1.60	4.00	4.00	4.00	--	--	--
KAU	7.17	7.17	7.17	7.17	--	--	--	--	--	--
TOTAL	55.51	51.51	51.51	43.51	4.00	4.00	12.00	--	--	--
PSS	19.89	19.89	19.89	19.89	--	--	--	--	--	--
MIN	16.77	16.77	15.93	15.50	--	0.84	1.27	--	--	--
B.C. GIR	10.70	10.70	10.70	10.70	--	--	--	--	--	--
KAU	15.45	15.45	15.45	15.45	--	--	--	--	--	--
TOTAL	66.81	66.81	65.97	65.54	0.00	0.84	1.27	--	--	--
PSS	176.00	163.00	157.00	80.00	13.00	19.00	17.00	--	--	79.00
MIN	98.31	98.31	83.56	65.86	--	14.75	32.45	--	--	--
D.C. GIR	38.96	38.96	27.27	21.03	--	11.69	17.93	--	--	--
KAU	73.27	73.27	69.60	62.27	--	3.67	11.00	--	--	--
ATA	13.00	11.00	11.00	9.00	2.00	2.00	4.00	--	--	--
TOTAL	399.54	384.54	348.43	238.16	15.00	51.11	82.38	--	--	79.00
PSS	266.34	202.80	160.10	12.50	63.54	106.24	29.50	--	--	224.34
MIN	247.70	247.70	180.82	99.08	--	66.88	148.62	--	--	--
FC GIR	118.05	118.05	100.34	54.30	--	17.71	63.75	--	--	--
KAU	312.53	296.90	281.27	145.45	15.63	31.26	58.31	--	--	108.77
ATA	14.00	10.00	10.00	3.40	4.00	4.00	11.60	--	--	--
TOTAL	958.62	875.45	732.53	314.73	83.17	226.89	311.78	0.00	0.00	333.11
PSS	45.00	10.00	10.00	3.00	34.20	34.20	5.00	--	--	37.00
MIN	65.00	26.00	5.36	4.00	6.00	16.64	6.00	33.00	43.00	55.00
DRN GIR	--	--	--	--	--	--	--	--	--	--
KAU	35.00	--	--	--	15.00	15.00	10.00	20.00	20.00	25.00
ATA	2.00	0.50	0.50	--	1.50	1.50	2.00	--	--	--
TOTAL	147.00	37.30	16.66	7.00	56.70	67.34	23.00	53.00	63.00	117.00
PSS	534.97	424.23	375.53	135.13	110.74	159.44	59.50	0.00	0.00	340.34
MIN	442.78	403.78	300.67	199.44	6.00	99.11	180.34	33.00	43.00	55.00
TOTAL GIR	173.31	169.31	139.91	87.63	4.00	33.40	85.68	--	--	0.00
KAU	447.42	396.79	377.45	234.34	30.63	49.93	79.31	20.00	20.00	133.77
ATA	29.00	21.50	21.50	12.40	7.50	7.50	17.60	0.00	0.00	0.00
TOTAL	1627.48	1415.61	1215.10	668.94	158.87	349.38	430.43	53.00	63.00	529.11

REHABILITATION OF RBE SYSTEM UNDER ISMP  
 WATER MEASUREMENT STRUCTURES,  
 PRIORITY REHABILITATION AND REHAB. INLET CANAL  
 FINANCIAL STATUS REPORT AS OF 31 MARCH 1992

NATURE OF WORK	ALLOCATION	APPROXIMATE	BALANCE CARRYOVER	NEW	TOTAL
	UPTO DEC. 91	EXP. UPTO 5-92		ALLOCATION FOR 1992	ALLOCATION FOR 1992
WATER MEASUREMENT STRUCTURES 1989-1990	2,000,000	1,970,438	260,000	---	260,000
PRIORITY REHAB. WORKS 1991	3,000,000	1,773,371	740,000	---	740,000
REHAB. OF INLET CANAL	9,200,000	5,598,827	---	10,000,000	10,000,000
PRIORITY REHAB. WORKS 1992	---	62,164	---	1,500,000	1,500,000
TOTAL	14,200,000	9,404,800	1,000,000	11,500,000	12,500,000

REHABRBC

REHABILITATION OF RBE SYSTEM UNDER ISMP  
 WATER MEASUREMENT STRUCTURES,  
 PRIORITY REHABILITATION AND REHAB. INLET CANAL  
 PHYSICAL STATUS REPORT AS OF 31 MARCH 1992

NATURE OF WORK	PERCENTAGE COMPLETED UPTO 31-3-92			PERCENTAGE REMAINING FOR LOP		
	SURVEYING	DESIGN	CONSTRUCTI	SURVEYING	DESIGN	CONST.
1989-1990 WATER MEASUREMENT STRUCTURES	100	100	100	0	0	0
PRIORITY REHAB. 1989-1990	100	100	95	0	0	5
REHAB. OF INLET CANAL	100	100	15	0	0	85
WATER MEASUREMENT STRUCTURES 1992	100	100	0	0	0	100

REHABRBC

IRRIGATION SYSTEMS MANAGEMENT PROJECT - AMFARA RANGE  
 MONITORING SURVEYS, DESIGNS AND CONSTRUCTION  
 OF PRAGMATIC REHABILITATION WORKS  
 GAL OYA RIGHT BANK SYSTEM  
 AS OF 31 MARCH 1992

TABLE 2.2-3

CANAL	TOTAL LENGTH (Km)	COMPLETED AS OF 31 MARCH 1992			REMAINING FOR 1992 PROGRAM			REMAINING FOR LIFE OF PROJECT		
		SURVEY	DESIGN	CONST.	SURVEY	DESIGN	CONST.	SURVEY	DESIGN	CONST.
M.C	35.20	35.20	35.20	33.44	--	--	1.76	--	--	--
B.C	84.00	84.00	79.00	20.16	--	4.20	63.84	--	--	--
D.C	175.00	131.25	18.90	--	43.75	156.10	35.00	--	--	140.00
F.C	227.40	13.60	--	--	113.70	68.22	22.74	100.10	159.18	204.66
DRN	100.00	--	--	--	--	--	--	100.00	100.00	100.00
TOTAL	621.60	264.05	133.90	53.60	157.45	228.52	123.34	200.10	259.18	444.66

MSDC606

IRRIGATION SYSTEMS MANAGEMENT PROJECT - AMPARA RANGE  
 MONITORING CONSTRUCTION OF PREVENTATIVE MAINTENANCE WORKS  
 SAL OYA LEFT BANK SYSTEM  
 AS OF 31 MARCH 1992

TABLE 2.2-4

CANAL	TOTAL LENGTH (Km.)	COMPLETED AS OF 31 MAY 1992			REMAINING FOR 1992 PROGRAM			REMAINING FOR LIFE OF PROJECT		
		SURVEY	DESIGN	CONST.	SURVEY	DESIGN	CONST.	SURVEY	DESIGN	CONST.
M.C	78.49	--	--	66.30	--	--	4.19	--	--	--
B.C	36.49	--	--	29.19	--	--	7.30	--	--	--
D.C	281.22	--	--	126.55	--	--	7.00	--	--	154.67
F.C	362.40	--	--	54.36	--	--	126.84	--	--	181.20
DRN	---	--	--	--	--	--	--	--	--	--
TOTAL	750.60	--	--	276.40	--	--	145.33	--	--	335.87

MSDCBOLR

## 2.3 FINANCIAL MANAGEMENT IMPROVEMENT

### 2.3.1 ACCOMPLISHMENTS

As expected over the LOP some major accomplishments were expected to be achieved under the Financial Management Program, these accomplishments were:

- o Assisted the DCFOs to levy a membership fee from the members instead of O&M fees
- o Assistance provided to IMD in introducing a simple FM system to the DCFOs
- o DCFOs create Development Funds and utilize that money for supplying of agro-inputs and to buy materials for construction work
- o 125 DCFOs have a balance of Rs 2,465,315 in their Development Funds
- o FM Assistance, Institutional Organizers and F.C. representatives were trained in Financial Management in order to have healthy DCFOs
- o 155 DCFOs have opened bank accounts
- o The preparation of annual budgets were introduced to the DCFOs
- o 22 DCFOs obtained credit facilities to buy fertilizer and Agro-Chemicals from the banks
- o DCFOs maintained the Address Records and Specification Registers of their own DCFOs.
- o 17 DCFOs engages in marketing of agricultural produce in concurrence with the Regional Rural Development Bank
- o Advice and guidance were given to the DCFO Treasurers in preparing the income and expenditure statements
- o The audit in FOs are taking place in accordance with the FO constitution by hiring a part time person knowledgeable in accounting.

### 2.3.2 INNOVATIVE STRATEGIES ADAPTED

- o The U&M water user fee was not collected from the farmers from the latter part of 1988 and the Government has not encouraged the farmers to pay the fee as those in previous years. From 1988 Operations and Maintenance fee collections had stopped in all the Schemes due to the disturbances in the island.

- o Executive committees of some DCFOs decided to levy a membership fee from the member farmers for the development of the DCFOs. This was originally started in Minneriya and Kaudulla Schemes and then followed by the other Schemes.
- o Some DCFOs were keen on promoting a Development Fund in their organizations. This Development Fund consists of membership fees, enrolment fees, special contributions from the farmers and whatever the money they have collected from entertainment shows, farmers, etc. In ISMP, some 145 Farmer organizations have started Development Funds in their organization and this money has been deposited at the State Banks and Cooperative Rural Banks.
- o Some DCFOs who have management capabilities have decided to utilize the Development Fund money for the benefit of their member farmers and started supplying agro-inputs with the help of the Systems Level Farmer Organization. In addition to the supply of agro-inputs, some have engaged in marketing activities too.
- o The DCFOs have maintained Cash Books, General Ledger, Purchase and Sales Ledger, Membership Register, Address Records and Specification Register. Where the need arises they have introduced other books too.
- o The DCFOs are becoming creditworthy and they had discussions with the Banks and obtained loans for purchasing agro-chemicals. Some have obtained large loans to purchase paddy from farmers.
- o The DCFO officials created an enthusiasm and demanded training for preparation of Annual Budget, Preparation of Crop Production and Annual Maintenance Plans.

### 2.3.3 SUCCESSES AND SHORTCOMINGS

The objective of the Improvement Financial Management System was in the collection of O&M funds available at the proper time and in the appropriate amounts. The FM System developed in 1988 was designed to increase the level of accounting capability in the Project offices and DCFOs. It attempted to establish a loss recovery system for D and F canal O&M costs, improve record keeping and train DCFO farmer representatives in carrying out the procedures relevant to operating and maintaining the D and F canal system. The records and registers to be used in the plan are computer based. The system is based on the following components:

- o O&M Project Awareness Record
- o Specification Registers
- o Current year and five year payment record
- o Address Record
- o Unauthorized irrigated land O&M fee payment records.

This program was started on a pilot basis, however, it could not continue due to non-availability of O&M fees and non-accessibility to the computers because none were available for their use. As expected, FM/MEF Assistants were not given the training in computers. As planned, DCFO officials were not trained in FM till 1991. Under the 1991 Work Plan the FM System was discussed in detail and a simple FM System was introduced to the PMs, IDO, FM/MEF Assistants by the Deputy Director IMD in January 1991. In turn, FM Assistants and IDOs trained the DCFO officials in FM and all DCFOs began to keep their books and records. This was just a beginning and should be a continuous program to assist the DCFOs in FM practices.

- o Most of the treasurers in the DCFOs belong to the old generation so it takes more time for them to understand. Most do not have the basic educational qualifications to follow this training, however, they are very honest and trustworthy farmers.
- o DCFOs have become the legal entities under the Agrarian Services (Amendment) Act No. 4 of 1991 and some are considering doing agro-businesses to become self-reliant. They need more training in agro-business, a skill development and financial planning in the near future.
- o DCFOs levy a membership fee from the members. This fee is different from one DCFO to another DCFO and sometimes from one Project to another Project and it is not a standard fee. In the 1992 Work Plan it was proposed that this levy should be one bushel per acre per season. This amount was considered a reasonable fee to cover all O&M requirements. The importance of this fee requirement should be explained to the farmers as the basis for getting viable FO and the unseen potential dividends that will be gained by its members.

#### 2.3.4 STATUS OF F.M. IMPROVEMENT AT PACD

The Implementation of the Financial Management System has taken place in DCFOs/SLFOs only in year 1991. The IOs that have remained on the Project must give priority to FM activities at PACD and after PACD.

At the start of Project implementation, the water users fee was charged by the Government, however it was stopped due to civil disturbances in the country. Subsequently, farmers themselves decided to levy a membership fee from the members.

The PMs, IDOs, FM Assistants, IOs and Farmer Representatives should take an initiative to enrol all water users as members of the DCFOs as up to now only about 60% are members of the DCFOs and therefore immediate steps should be taken to enrol the remaining 40% as members.

The collection of fees should be continuously on a bi-annual basis. It is important to collect membership fee from all members without

any dues. The collection of fees can be handled by Farmer Representatives and they should be remunerated for their services. As proposed in the 1992 Work Plan the levy should be one bushel per acre per season and this could be implemented at PACD.

The Government should state their Policy on Farmer Organizations formed in Major Irrigation Settlements even at the PACD. Delaying of stating the Government Policy is not a healthy citation for the development of viable Farmer Organizations.

Some Farmer Organizations are following the preparation of Annual Budgets and Annual Maintenance Budgets and Plans with the help of the Irrigation Department. This has to continue even with the monthly income and expenditure statements.

After obtaining the legal recognition some DCFOs are now capable of getting bank credit for their new activities in the DCFOs. When the DCFOs are in a sound and viable state and creditworthy they will be able to raise bank funds for their projects.

## 2.4 MONITORING EVALUATION AND FEEDBACK

### 2.4.1 ACCOMPLISHMENTS

Over the Life-of-Project a considerable effort was involved to achieve the accomplishments outlined in the Project Paper for the MED Component.

For the first two years of the Project, a MEF System was prepared under the guidance of an Expatriate MEF Specialist with the assistance of a local MEF Assistant. During that period of time no counterpart MEF Deputy Director had been assigned by IMD for coordination with the MEF Specialist on the MEF Program being developed. Since there was little guidance from the IMD on the MEF Program needed for the ISMP, the Consultant Specialist attempted to satisfy the requirements in the Project Paper as well as the recommendations made in the USAID Assessment Report of December 1988. However, at the Mid-Term Evaluation, the MEF Program that has been prepared up-to that date was considered too complicated and extensive with some 538 indicators to be effectively implemented as the MEF Systems for monitoring the ISMP on a seasonal basis. Therefore, the following recommendations were made at the Mid-Term Evaluation to attempt to get the MEF program back on track and have it in place and working before PACD.

- o An in-depth assessment of existing MEF Systems should be initiated
- o The assessment should be carried out by a highly qualified professional with demonstrated experience in implementation of Information Management Programs both at the National and Project levels.

The Assessment of the MEF System should be carried out in three stages, namely:

- Stage I - Review Project MEF documents and interview personnel to be involved in MEF Program
- Stage II - Conduct a workshop to define the indicator required, staffing and training requirements and formulate formal and informal communication and feedback strategies.
- Stage III - Determine details of technical issues such as the formulation indicators, sampling techniques, monitoring forms and reporting procedures.

Once the MEF System starts to function, another review by the MEF Specialist is necessary to ensure the program is in place and works. A final workshop should be held to review progress and make necessary changes to institute the system throughout the ISMP and INMAS Programs.

Based upon the above recommendations in the Mid-Term Evaluation Report, IMD initiates a program to follow the recommendations by authorizing the Consultant to bring a highly experienced Expatriate MEF Specialist to the Project to make the in-depth assessment of the MEF Program developed to date under ISMP.

From the date of the Mid-Term Evaluation to the time which the MEF Specialist was planned to come to review the Program was a period of about one and a half years. During that period the MEF Program developed in the first two years of the Project was revised to fit the recommendations of the Mid-Term Evaluation Report.

During late 1989 and 1990 the emphasis was to perform the following in advance of the In-depth Assessment.

- o Review and Refine MEF Report - Current data collection efforts and MEF reports were reviewed and refined based upon feedback from DCFOs to IMD and ID. Revisions were made to the existing MEF Computer Program to revise the report format and to considerably reduce the number of indicators to about 125.
- o Training Program for MEF - Data collection formerly by KVSN of the Extension Division of the DOA no longer could be counted on. Previously 74 had been trained and it was planned to train another 190 in 1990 but this never materialized. Therefore, other sources of enumerators for data collection were required. IOs were to be considered for this data collection and training in MEF data collection was provided during 1990 to fill the gap of KVSN. Four MEF/FM Assistants were given training on post-harvest data collection in 1990.
- o MEF Implementation Area for 1990 - The post-harvest data collection program was implemented in 34 DCFOs in 1989 and 62 DCFOs in 1990 including Gal Oya RB. The areas where MEF programs was implemented in 1990 is presented on Table 2-4-1 below:

TABLE 2-4-1  
MEF IMPLEMENTATION AREA 1990

DCFO		Number of DCFOs for MEF Implementation			
Number	Name	1988	1989	1990	Total for 1990
1	PSS	1	4	7	12
1	Minneriya	1	11	4	16
1	Kaudulla	1	8	9	18
1	Giritale	1	3	2	6
1	Ridi Bendi Ela	1	3	3	7
1	Gal Oya	0	0	3	3
Total		5	29	28	62

- a) Post harvest data collected following the 1989/90 Maha and the 1990 Yala seasons.
- b) Seasonal MEF reports prepared for the two seasons.

In late 1990, IMD requested USAID to approve a three-month short term assignment of the MEF Program as of January 1991. The assignment was approved and Sheladia Associations Inc. engaged Dr. Kenneth Smith, a person with very substantial experience at national and project level Management Information Systems (MIS).

During Dr. Smith's first assignment to ISMP (1/1/91 to 2/4/91) he worked directly with IMD's MEF Deputy Director, Mr. W. Ellawela, to help review the existing MEF System as directed by IMD. The key accomplishments during this assignment are summarized below:

- o Discussion with IMD/USAID/ID Senior officials to develop and define the Scope of Work of Assignment and to examine existing MEF Reports and methods for collecting data and reporting information for Project Monitoring and Evaluation purposes.
- o Two field visits were made to 5 of the 7 Irrigation Schemes of the Project to evaluate the existing MEF practices and to interview ID, IMD and DCFO members regarding the requirements for information to monitor and evaluate project progress and to inspect the status.
- o After the two field visits, a draft of the Manual for Analysis of MEF System Data and the MEF System Manual was submitted to IMD/ID and a three day Actin Training Workshop/Seminar was held in Colombo to review and finalize the two Manuals.
- o A draft report on findings and recommendations was prepared and submitted to USAID and IMD and followed by review and modification to the recommendations. The MEF Specialist Assignment was extended by USAID to
  - finalize the MEF Report of Findings and Recommendations
  - Conduct a one-week workshop in Statistical Data Analysis - to teach MEF Assistants and IDOs to analyze post-harvest survey data
  - Finalize MEF Seasonal Survey Questionnaires
  - Finalize new MEF System Manual and detailed description of new MEF System recommendations for ISMP/INMAS
  - Finalize MEF Monthly Report for I&M and FO activity

- Conducted a four-day Workshop to assist MEF Assistants to process data from the monthly reports and then prepare the initial MEF Monthly Reports for February 1991.

At the end of the Specialist's first assignment on ISMP, a new MEF System had been introduced and Monthly Reports starting in February 1991 were ready to be issued and continued thereafter. During the remainder of 1991, this MEF System was Pilot Tested in 16 Major Irrigation Schemes - six (6) initially under ISMP and subsequently four (4) under World Bank MIRP, as well as six (6) other schemes under GOSL INMAS Program.

During the period from February 1991 to December 1991, 11 MEF Reports were issued utilizing the MEF System adopted by the first assignment of Dr. Smith. USAID and IMD agreed it would be beneficial for Dr. Smith to return for a one month assignment in January/February 1992 to review and follow-up the status of MEF implementation prior to termination of USAID TA under ISMP.

During his second assignment, he again worked with IMD MEF Deputy Director, Mr. W. Ellawela, and performed the follow-up actions:

- o Reviewed and discussed the 11 months of efforts and prepared reports for February - December 1991.
- o Made field trips to all seven ISMP Schemes and one MIRP Scheme to meet project officers responsible for the MEF System at the Scheme level. Attended Project Committee Meetings, DCFO Meetings, FCG Meetings and had discussions with Project Managers, IEs, IDOs, MEF/FM Assistants, FCRs, DCFO officials to discuss the MEF System that was implemented during 1991. Sufficient information was collected during the field visits to provide a meaningful feedback for MEF Systems Program Assessment.
- o A draft assessment report on findings and recommendations was the basis for a two day action-training workshop/seminar. The objective of the workshop was to verify the findings of the field visits with participants (PM, MEF Assistants, IDOs, ID and selected farmers).
- o A follow-up review was held with Senior IMD/ID and USAID officials to review and discuss the findings and recommendations of the initial assessment of the MEF System implementation in 1991.
- o A final report was prepared and submitted with detailed findings regarding the three reports to be issued under the ISMP Program -- i.e. Annual/Seasonal Planning Report; Monthly Report; and Post-harvest Seasonal Survey Report.
- o A final workshop was held for ISMP/INMAS Project Manager and selected staff members to have them finalize with them the MIS components and to prepare them for adopting

and replicating the MEF System throughout the country.

As a result of this assignment by the MEF Specialist, a new MEF System was introduced under the ISMP that was working satisfactorily at PACD and was being implemented in the Major Irrigation Schemes under the INMAS program by IMD.

#### 2.4.2 INNOVATIVE STRATEGIES ADAPTED

Several problems were encountered in implementing the MEF System for ISMP during the first 2 1/2 years of the Project; however, after the Mid-Term Evaluation the MEF System was re-designed and successfully completed before PACD.

The primary reasons for the success of the system was the adoption of a series of workshops during the formulation and final evaluation stages of the program to ensure that all participants at the Scheme level as well as the National level understood the System proposed and were ready to implement the System and replicate it throughout the country. The strategy of using a series of workshops were found to be instrumental in the using a series of workshops were found to be instrumental in the implementation of the new MEF System which provides three Reports, one for Annual/Seasonal Planning; one for Monthly Reports, and one for Post-harvest season survey. Without the series of seven workshops conducted during Dr. Smith's two assignments, it is doubtful that the new system would be effectively in lace and running by PACD.

#### 2.4.3 SUCCESSES AND SHORTCOMINGS

##### 2.4.3.1 Successes

- o The major successes of the MEF component is that a simple and practical MEF system has been developed and tested for a year and a half and found to be adequate for monitoring the FOs progress in their development process.

##### 2.4.3.2 Shortcomings

- o It was unfortunate that it took 2 1/2 to 3 years of the Project time and money to get the MEF system that was needed for ISMP in place and running. Many features contributed to this delay, but eventually the system needed was provided by PACD. However, only MEF Reports for the last 17 months of the Project were available for use with the new system during the LOP.
- o Computers were not provided for the MEF component and this was a major deficiency that had to be overcome during the LOP.
- o The MEF system adopted for ISMP is not computerized, however, this can be done using an existing computer program at little cost to ISMP.

- o Monthly reports scheme was providing the monitoring data to each DCFO in the Scheme. This should be printed and circulated to all Scheme level officers.

#### 2.4.4 STATUS OF MEF AND PACD

The status of MEF System as of PACD is:

Despite some resource limitation, and a few minor problems, the MEF system designed in February 1991 and tested initially during an 11 month period in 1991 on six ISMP Schemes is intact, and has been implemented conscientiously by IMD Headquarters, Project Managers and field personnel for the past 16 month. In the MIRP and INMAS Schemes, for the most part, pilot implementation only began in the past eight months, but the personnel involved were generally enthusiastic about the MEF's potential, and some slight modifications have already been made to the report questionnaires.

At PACD, most attention and effort has been devoted to establishing reporting formats and routing channels -- from the various farmer organizations to the Scheme Projects Manager, and then to the IMD Deputy Director for MEF -- and manual summary/analysis and charting progress. To the degree that it has been implemented, the MEF is functioning largely as intended, and is now beginning to provide useful feedback -- for both farmer organizations and GOSL managers. Some of the key concerns of farmers in the ISMP Schemes (as well as concerns of the GOSL) are now being tracked and highlighted by the MEF System. Issues highlighted in each MEF report now constitute the agenda for each area's Project Management Committee to review -- and attempt to resolve -- during its monthly meetings.

Visits with farmers and other involved officials indicate however that while the general status of irrigation and farm organization development throughout the country is becoming clearer to officials at both the field and central office levels, this increased awareness -- as a result of the MEF -- is not being matched with an enhanced response, or an increased capacity to rectify the constraints so noted and prioritized. Consequently, the level of farmer frustration with perceived Government inaction is beginning to rise.

The present pattern of reporting, analysis and presentation from farm organization to the GOSL is only a necessary first step (which should be retained for the foreseeable future). A similar pattern should also be established and sustained at the next lower level -- i.e. within each farmer organization -- from the farmers Field Canal (FC) representatives, to the DCFO chairman, for summarization and comparative analysis by, and within the DCFO.

Computerization of the MEF at each Scheme Project Office -- while highly desired, and indeed desirable -- is not essential. The requisite analysis can be done manually, although it requires considerably more time and effort than is currently being expended on data analysis. Indeed given the current extent and condition of ISMP, MIRP and INMAS field-level buildings, office equipment

furnishings -- i.e. minimal electric power, poor environmental conditions for operation and maintenance and storage of typewriters duplication/re-production equipment, photocopiers, and scarcity of expendable supplies -- there simply is no provision for effective utilization and/or support of computers at present. Nevertheless, when IMD is ready and able to upgrade some selected field-level office environments, computerization of the MEF system -- for instance the Polonnaruwa and Ampara District levels are appropriate local points to summarize data on the Schemes within those Ranges -- and this would be an appropriate first step to facilitate more comprehensive data analysis and realize the MEF's fuller potential.

Lack of, and/or inadequate transportation is another concern of the Project Managers, and particularly IMD's MEF Deputy Director which is currently constraining effective implementation of the MEF. This will be particularly important for supervising and extending the MEF further afield to different Schemes, and in greater depth at the DCFO levels.

With respect to the development of DCFOs and turnover of responsibility for the Distributary Canal System, it would be appropriate to formalize the individual approach to DCFO readiness assessment/evaluation, and conduct wider widespread awareness training based on the current "score card".

Much more remains to be done to strengthen this fledgling MEF system within the pilot areas, as well as to provide the impetus and the means for replicating the MEF model in the other -- as yet unreached -- INMAS Schemes. In retrospect, the MEF was originally anticipated under ISMP to require two years of development and three years of implementation to attain full affectivity. Given its late development in the ISM Project, the current status of MEF implementation after only one and a half years is commendable. The system is beginning to demonstrate its utility as a catalyst for what could ultimately become a new paradigm for farmer level organizational development. Nevertheless the MEF has not had time to mature; is not yet institutionalized, and its full potential has still to be realized. For example, in addition to setting the agenda for monthly Project Committee Meetings and resolution of issues, priorities highlighted in the MEF could also be the basis for scheduling 10 monthly work activities.

IMD's Deputy Director for MEF and the ISM Scheme, Project Managers have provided the leadership to date to coordinate MEF implementation, but it has been the MEF Assistants and Institutional Organizers at the Scheme level who have played -- and for the foreseeable future must continue to play -- the key intermediary change-agent role to institutionalize and replicate this system at the Farmer Organization level. Without the ability for IMD MEF implementing personnel to meet and follow-up regularly with DCFO representatives in face-to face meetings, the MEF will rapidly degenerate into a written report which is prepared and distributed but goes largely unread -- rather than a systematic means for identifying issues and generating action -- and implementation will falter.

More sophisticated analysis of existing data is feasible, but it cannot be undertaken without additional training for MEF Assistant and/or IDOs who are processing the data. Accessibility to a computer would also facilitate such analysis.

Most individuals responsible for the gathering and analysis of data -- i.e. IOs, IDOs, and MEF Assistants -- are contractual personnel whose employment is co-terminus with the LSM-funded Project. (Survey Enumerators also play a vital role collecting data from farmers from the Post-harvest Survey.) The rate at which officials and individuals in various Irrigation Schemes and DCFOs learn to use the System find it useful in meeting their needs, and accept responsibility for its continued operation varies considerably from one situation to another. At this early stage of MEF System installation, it is premature to anticipate terminating the involvement of such individuals in MEF implementation and future development for the foreseeable future.

## 2.5 TRAINING CAPACITY ENHANCEMENT

### 2.5.1 ACCOMPLISHMENTS

Under the ISMP Training Capacity Enhancement Component, training support was provided primarily to assist the following four Project components to implement their respective activities over the LOP.

1. Farmer Organization Development Component
2. Operation and Maintenance Improvement Component
3. Financial Management Improvement Component
4. Monitoring, Evaluation and Feedback Component

Training activities that were planned for these components were generally on schedule and the objectives of the training programs, in terms of the number of people trained, were realistic.

To achieve the main objectives of the Training Capacity Enhancement Component, it was planned to provide both In-Service training to ID, IMD and DCFO members as well as to provide overseas training to selected project participants. The major effort on ISMP was to strengthen the capacity of the ID/IMD and DCFO members by a series of well developed in-service training programs in FO Development, O&M, FM and MEF implementation requirements.

One of the main objectives of the ISMP was to improve the participatory management in the Distributary Canal System Service area. This requirement became even more essential based upon the GOSL decision in early 1989 to turn over the Distributary Canal Systems to the Farmer Organizations for operation and maintenance. Because of this decision, IMD decided to institute a series of Agency In-Service and Farmer training programs in operation and maintenance.

These in-service training programs were based on the objectives of the ISM Project and on the GOSL's participating Water Management Policy. The ISMP in-country training programs were directly managed by IMD while over-seas training programs were organized and programmed by USAID. In both the in-country and overseas training, the aim was to improve the management capacity of the farmer organizations to assure a greater responsibility for Distributary Canal operations and maintenance works. Some of the in-service training that was provided in late 1990 and early 1991 that was directed towards achieving this goal is summarized below:

IN-SERVICE TRAINING BY J. McCALLUM/H.P. PREMARATNE  
IN 1990 AND 1991

- o Technical Assistants
  - Module 1 - D-Canal Maintenance
  - Module 2 - Main System Maintenance
  - Module 3 - Implementation Maintenance Plans
- o Institutional Organizers/Course Report No. 1
- o MEF/FM Assistants Course Report No. 2
- o TA Module 1 Course Report No. 3
- o TA Module 1 Course Report No. 4
- o WS Module 1 Course Report No. 6
- o Field Canal Representatives Course Report No. 7
- o Training TAs Training Teams Course Report No. 8
- o WS Module 2 Course Report No. 9
- o WS Module 1 Work Organization
- o WS Module 2 Quality Control

In addition, in-service training to over 80 Technical Assistants was provided in water measurement and calibration to assist in the improvement to Irrigation Systems Operations. Twelve Irrigation Engineers also received training in the United States in the application of the Computer Assisted Water Management Model that was developed for improving System Operations. After receiving training in the USA, these engineers were further indoctrinated in the use of the computer model by applying the information gained from the training on water measurement and calibration to the computer model for two of the schemes under the ISMP. At PACD the computer model is being implemented in these two Schemes for improved water management practices, as a result of these two in-service training programs.

In-service training in MEF and FM was also conducted to Project Manager, MEF/FM Assistants, IDOs and selected IOs. Training in these areas was intended to provide a means for these IMD officers to be able to train the members of the DCFOs in both MEF and FM. This was a major achievement under the Project or as both FM and the Monitoring of DCFO activities is critical to FO sustainability.

The overall LOP accomplishments under the Training Capacity Enhancement Component conducted by IMD for In-Country and Overseas Training is presented on Tables 2-5-1 and 2-5-2 respectively. As can be seen by these tables, considerable training was accomplished under the ISMP.

#### 2.5.2 INNOVATIVE STRATEGIES ADOPTED

The approach adopted by the Training Consultants for the In-service training was highly successful, and in this instance the active support extended by Irrigation Department and Irrigation Management Division officials were remarkable. At the initial stage of the training program, the Consultant had to identify the training needs and number of people of the various target groups to be trained. To accomplish this, the Project Manager, Irrigation Engineer,

Technical Assistants, Work Supervisors, IDOs, Institutional Organizers and Financial Management Assistants were interviewed by the Consultant with the support of senior management officers in order to determine the training requirements for each individual group.

Following the identifications of the training needs of the various groups, the Consultant prepared the draft training modules manuals, hand-outs, work notes and briefing instructions and then circulated these documents to senior IMD/ID officials for comments. All comments were then amended to the manuals, modules and training aids accompanying documents prior to the start of actual training.

The mutual confidence and frank discussions held between the senior IMD/ID management with the Consultants prior to the training ensure that the Consultants would run the courses with technically competent documents based upon sound practical training methodologies.

In addition to this aspect, the Consultants planned the implementation program in such a manner that the outputs from one course were used as inputs to subsequent courses. When adopting training methods, it was planned that the participants would have a clear understanding of the job they were to perform under the training program and that they should have the desire to do the job to the set of standards at the end of the training.

Special innovative training strategies were introduced by Consultant's, J. McCallum and H.A. Premaratne, in initiating 14 training modules and courses during 1990 and 1991. The strategies used to implement these courses which involved FO Development, O&M, FM, MEF and Construction Practices for PM, IDOs, IOs, TAs, WSS, MEF/FM Assistant and FO Field Canal Groups were unique and highly successful. The practical approach using a combination of classroom techniques where all members of the groups actually participate in the training programs and produce the results that could eventually be implemented in the field. After group participation in the classroom, field trips to the work areas of the various groups were taken and exercises conducted as on-the-job training of what they had learned. In almost all cases, the results of this type of training was very successful and the people trained were able to implement their respective works in a better manner and to train others in what they had learned.

### 2.5.3 SUCCESSES AND SHORTCOMINGS

In ISM Project areas, tangible results have been achieved after completion of successful training programs. The first of these represent the transfer of skill to participants; one of the major successes in practical training approach was the walk-through maintenance survey used to develop the Annual Maintenance Plans. The surveys and annual maintenance plans were produced by Technical Assistants for Distributary and Field Canal Systems with the farmer representatives of each of the 92 DCFOs surveyed. During this walk-through survey the farmer representatives received on-the-job

training on how to maintain their Distributary Canals. Similarly, the Technical Assistants have taken more effective roles in advising and training farmers on how to operate and maintain their Distributary Canal Systems. This approach has enhanced the participatory approach to Irrigation Systems Management.

In this regard, it was a noticeable fact that ID/IMD officers who were trained under the Project, i.e. WSs, IOs and FM Assistants were taking an active part in assisting the Farmer Organizations in their development work. This was accomplished either by individual visits or by group training programs to Field Canal Group Representatives. In addition, Range Training Teams were formed under the leadership of Technical Assistants and it was expected that the Institutional Development officers would take active part in these Range Training Team activities.

Another success in ISMP training was the training given to farmers by the TAs and WSs when the DCFOs took construction contracts. Initially DCFO contracts were not being successfully completed because the farmers lacked knowledge of construction management, construction practices and construction quality control. Eventually the TAs and WSs initiated training activities with the farmers to improve their construction management and quality control practices and by PACD the efficiency and quality of construction had improved remarkably due to this training.

As a result of the training programs implemented over the LOP; the participatory approach to the training of ID/IMD officials and farmers at all levels have changed their attitudes towards one another. Especially, the farmers attitudes towards the Irrigation Department and IMD officials have been changed remarkably and the spirit and cooperation that was developed over the LOP will help sustain the concept of Participatory Management of Irrigation systems.

#### 2.5.4 STATUS OF TRAINING CAPACITY ENHANCEMENT AT PACD

The farmer representatives and agency personnel who were involved in Irrigation Systems Management Project were provided with intensive training programs in order to steer the project satisfactorily.

However, at PACD Consultant's were not in a position to train all the personnel working in the ISM Project areas, as envisioned in the Project Paper. The training programs continued up to the end of 30 June (PACD) and a summary of the major programs implemented over LOP are:

TASK 5.0 - TRAINING CAPACITY ENHANCEMENT

Table V-1  
Sheet 1 of 2

The tabulation below summarized the training completed from 1987 to 1992 and the training programmed for 1992.

TRAINING PROGRAMS COMPLETED AS OF 1991 AND PROGRAMED FOR 1992.

IN COUNTRY TRAINING	COMPLETED DURING (Persons)						TOTAL (1987/91)	1992 Program (Persons)
	1987	1988	1989	1990	1991	1992		
<b>A. FUNDED FROM IMD FUNDS</b>								
Task 1 FARMER ORGANIZATION								
Project Managers	5		5	8	3		21	
Operations Management								
Awareness-Leadership Building								200
Agro Processing and Packing								792
Trade and Marketing								396
Skills Development								1300
Task 2 OPERATION AND MAINTENANCE								
IEs - Water Management SLITI	--	--		8	15		15	
TAs - Hydraulic Operations	--	--		60			60	
TAs - SLITI	--	90	90	90	15		285	
TAs - Quality Control	--			50			50	
TAs - Maintenance	--			50	15		65	
TAs - Water Management SLITI	--			5			5	
IEs - Water Management Model				8			8	
IEs - Design and Programming	--			8			8	
Computer Operators (W.M.Model)	--			5			5	
WSs - Quality Control	--			60			60	
WSs - SLITI	--	93	90	50	30		263	
Farmer Leader O&M - GITI	--			8	30		30	
Drivers/Operators-Maint. SLITI	--			8	30		30	
WSs - Maintenance	--			8	30		30	
Task 3 FINANCIAL MANAGEMENT								
FM/NEF Assistants	--		5		6		11	20
DCD Office bearers								895
IOs								120
Task 4 MON. EVAL. & FEED BACK								
IOPs - Enumerators	--			100	100		200	120
FM/NEF Assistants	--		5	7	9		21	8
Computer Operators	--	6		1			7	
Computer Supervisors	--	6		1			7	6
Monitoring Officers								8
DCG Reps.								680
FCG Reps.								1350
Sub Total	5	195	195	503	283		1181	5895

120

TASK 5.0 - TRAINING CAPACITY ENHANCEMENT

Table V-1  
Sheet 2 of 2

The tabulation below summarized the training completed from 1987 to 1992 and the training programmed for 1992

TRAINING PROGRAMS COMPLETED AS OF 1991 AND PROGRAMED FOR 1992.

IN COUNTRY TRAINING	COMPLETED DURING (Persons)					TOTAL 1987/91	1992 Program (Persons)
	1987	1988	1989	1990	1991		
Task 6 CROP DIVERSIFICATION							
Awareness Training to officers	--			150	150	300	
Field Officers - SMD, AI, GSN	--			400	201	601	
Awareness Training to Farmers	--			300	480	780	
Sub. Matter Training to Farmers	--			300	480	780	
Field days/Tours	--			1000	800	1800	
Field Ext. Volunteers	--			0	212	212	
B. FUNDED FROM USAID GRANT (05 RECURRENT EXF)							
Task 1 - FARMER ORGANIZATION							
IDO - Pre-service Training	10		10	10	2	32	
IDO - In-service Training		10	10	6	9	35	
IO Pre-service Training	65	94	132	11	40	342	20
IO In-service Training		60	60	110	40	270	47
Field Officers			600	182		782	--
DCO Office Bearers			180		420	600	465
F.O. Representatives			450	300	3976	4726	1450
Farmers On Job		2800	5120	300	935	9155	900
Farmer Exchange Program			325	20000	374	20699	377
Sub Total	75	2964	6887	23069	8119	41114	3259
Total In-Country	80	3229	7172	23752	8707	42890	9154
Overseas Training Funded by USAID Grant							
Academic US			4		3	7	
TCT			1		1	2	
Sub Total			5		4	9	
Technical US		8	3	15		26	
TCF		14	18	18		50	
Total Overseas		22	26	33	4	85	
Total Training Program	80	3,251	7,198	23,785	8,711	42,975	9,154

121

TABLE V - 2  
OVERSEAS TRAINING - FUNDED BY USAID GRANT

Name of Participant	Designation/ Agency	Course	Institution	Duration	Period		Cost \$	Post training Assignment/ Remarks
					From	To		
US-LT -----								
383-0081-1-68056 SV Ratnasara	IE/ID HO	M.S. in Eng. (Water Management)	U.S.U. Utah	18 Months	Jan. 89	Sep. 90	46177	N/A
383-0081-1-68057 D.Abesuriya	AD/DOA	M.S. In Agriculture	University of Arizona	18 Months	1-9-89	28-2-91	40850	
383-0081-1-69062 KAUS Imbulana	IE/Polonnaruwa	M.S. Irrig. Engineering		18 Months	10-1-89	30-9-90	45987	SLITI
383-0081-1-68083 MGM Razeek	IR&T Officer AR&TI	M.S. In Sociology		18 Months	6-1-90	6-6-90	41558	N/A
US-ST -----								
383-0081-1-68060 SS Ranatunga S Senaratna S Piyadasa Mrs. Samarasekera Mrs. Imbulana	DD IMD IE Hingurakoda DDI Polonnaruwa CIE Polonnaruwa IE DDI/Polon.	Course in D&M, Management of Irrigation Delivery systems	USU Logan Utah	6 Wks	2-10-82	12-11-89	43525	No Change
383-0081-1-68058 RWF Ratnayake W Ratnayake MR Jayasinghe	DD IMD Adl. DD(Ext)DOA DD-ID	Course on ME&F and Management of Agric. Systems. Visit to Islamabad, Lahore & Karachchi	CSU-Colordo	3 Wks	26-9-88	14-10-88	24250	N/A
383-81-1-69071 ANUB Alahakoon K Nittiyandana DS Ratnayake	> > IE ISMP >	1. On farm Irrigation Design & Evaluation 2. On farm wtr. scheduling 3. Main System ,, ,,	IIC-Utah Logan	11 Wks	7-5-89	29-7-89	35520	No Change
383-81-1-68086 MAMS Munasinghe DD Ariyaratna KW Nimal Rohana SLM Aliyar GP Perera RH Piyaratna WM Tilakaratna	CIE Kurunegala > > IE ISMP > > > DA Hingurakoda DA Polonnaruwa	Applied microcomputer use in Irrigation & Drainage	IIC-Utah	8 Wks	7-1-90	3-3-90	78095	No Change
383-81-1-68094 W Kuruppu PK Sugunapala	PM Kaudulla PM Minneriya	Training for trainers for Ag. & Rural Develop.	George Mason University	5 Wks	6-8-90	14-9-90	21708	No Change

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122

TABLE V - 2  
OVERSEAS TRAINING - FUNDED BY USAID GRANT

Name of Participant	Designation/ Agency	Course	Institution	Duration	Period		Cost \$	Post training Assignment/ Remarks
					From	To		
US-ST ----- 383-0081-1-60100 W Ellawela	DD IND	ME&F and Management of Ag. Systems	CIIM - CSU Colorado	3 Wks	3-9-90	28-9-90	8875	No Change
383-0081-1-60104 GT Jayawardena S Senthinathan D Wijenayake WAP Wijesooriya	PD ISMP DDI Ampara IE Polonnaruma IE Nikaweratiya	D&M and Management of Irrg. Delivery systems	IIC Utah	6 Wks	30-9-90	10-11-90	42720	----
383-0081-1-60106 WHE Premaratna	Adl Di- IND	1. Eighth International Soil corelation meeting Texas. 2. Annual Meeting of American Society of Agronomy, Texas		1 Week	21-10-90	26-10-90	5510	No Change
TCT 383-0081-1-60041 MMN Boteju W Kuruppu HA Karunasena	PD ISMP PM Kaudulla IE Kaudulla	Seminar, Workshop and observation tour in Manila, Bangkok and Kathmandu		3 Wks	9-4-88	29-4-88	11421	No Change
383-0081-1-60059 DG Premachandra GT Jayawardena LT Wijesuriya B Bulumulla	Adl. S.ML&MD PD ISMP Adl PD ISMP GA Kurunegala	Meetings, field visits in Phillipenes and Thailand		3 Wks	27-8-88	28-9-88	17070	No Change
383-0081-1-69084 WA Gnanasena PM Herathbanda MM Ukkubanda EW Sutatapala J Mudiyanse AA Mawatte DKT Ratnayake MM Gunaseskera PP Gunaratna	Farmer	Study tour Thailand	AIT Bangkok	3 Wks	1-10-89	21-10-89	18974	No Change
383-0081-1-60101 WLM Premadasa MK Wimalasena MPM Sunil Perera HP Sirisena MAS Premachandra ERE Suriyawardena UG Kiribanda AM Priyaratna HM Methubanda	PM Giritale > > > > Farmers > > >	Study Tour of farmer Organizations in Thailand	AIT Bangkok	3 Wks	22-8-90	15-9-90	19668	No Change

TABLE V - 2  
OVERSEAS TRAINING - FUNDED BY USAID GRANT

Sheet 3 of 5

Name of Participant	Designation/ Agency	Course	Institution	Duration	Period		Cost \$	Post training
					From	To		Assignment/ Remarks
TCT								
1383-0081-1-68861	DD IMD	Study Tour in Korea, Philippines & Bangkok		3 Wks	19-10-88	30-10-88	15923	No Change
ISA Gunasekera	Asst. LC							N/A
ISM Jayatilake	PM Dewahuwa							No change
IDC Perera								
1383-0081-1-68107								
Mrs. TLMC Senaratna	ALC	Study tour in Thailand	AIT Bangkok	3 Wks	1-10-90	20-10-90	23024	
Mrs. MCK Tennakoon	ICD							
PIA Silva	)							
IHP Ariyaratna	)							
KDI Jotiwanasa	) TA							
IHP Ariyapala	)							
WD Foneska	)							
UR Liyanage	)							
WIT Croos	)							
1383-0081-1-69063								
IRJ Gunawardena	TA Minneriya	Project Managers Course	NIA Consult	3 Wks	7-11-88	26-11-88	15040	No Change
WMD Amunugama	do Kaudulla		Inc.					No Change
S Liyanagamage	PM Hakwatunaoya		Manila					No Change
KMM Sheriff	do Galoya RB		Philippines					Adl GA Battica
1383-0081-1-69073								
S Senaratna	IE Hingurakgoda	Rehab. & Management of Irrig. Projects	AIT Bangkok	7 Wks	8-5-89	30-6-89	5632	No Change
1383-0081-1-69081								
SS Ranatunga	DD IMD	Study tour of		3.5 Wks	27-8-89	21-9-89	21320	No Change
UG Jayasinghe	GA Polonnaruwa	Indonesia, Korea						
S Balasingam	DDI Kurunegala							
GT Jayawardena	PD ISMP							
1383-0081-1-69079								
W Eilawela	DD IMD	1. Planning & Management of training programs	UNDP Manila	3.5 Wks	28-8-89	22-9-89	7630	No Change
IR Perera	IR&T Officer	2. Pre course study tour						
	IR&TI							
1383-0081-1-69082								
MKB Dissanayake	Asst. Com. DAS	Integrated farming	AIT Bangkok	6 Wks	18-9-89	27-10-89	8422	N/A
EMAK Bandaranayake	AG Instructress	Systems Management Program						
	DAS							
1383-0081-169068								
M Sirisena	PM Polonnaruwa	Human Settlement Devel.	AIT Bangkok	11.5 Wks	8-5-89	20-4-90	15222	N/A
		1. Certificate						
		2. Diploma						
1383-0088/21								
G Mudannayake	GA Ampara	Management Rural Devel.	AIT	4 Wks	20-8-90	14-9-90	7370	GA Ampara
UG Abegunawardena	PM Polonnaruwa		AIT	4 Wks	20-8-90	14-9-90	7370	PM Polonnaruwa
1383-0088/24								
V Jayasena	PM	Training	UNDP, Manila	3 Wks	5-11-90	23-11-90	7568	No Change
HMH Dissanayake	DDO Polonnaruwa	Training	UNDP, Manila	3 Wks	5-11-90	23-11-90	7568	No Change

124

TABLE V - 2  
OVERSEAS TRAINING - FUNDED BY USAID GRANT

Name of Participant	Designation/ Agency	Course	Institution	Duration	Period		Cost \$	Post training Assignment/ Remarks
					From	To		
US-ST 383-000-1-62167 S Dananagoriya	Asst Dir	Trn. on Organizations And Mgt. Development	USDA	1 Month	26-5-92	26-6-92	12,260	N/A
US-ST 383-000-1-62168 W Ellawela WD Tilakaratna WLV Premadasa	Dir. IMD PM IMD PM IMD	Trn in Organization and Management Development	USDA	1 Month	26-5-92	26-6-92	39,245	N/A
US-ST 383-000-1-62157 HPS Somasiri Mrs. VS Nallaperuma WG Siripala GP Gunawardena	DDI IE IE IE	Trn on on farm Irrig. Design, Evaluation and scheduling	IIC/USU USA	5 Weeks	13-5-92	13-6-92	43,665	N/A
US-ST 383-000-1-61149 PAKR Theodore	IE	Trn. course on Management of Irrig. Delivery System	USU/USA	2.5 Month	29-9-91	19-11-91	9,975	No Change
TCT 383-000-1-61148 PM Ariyaratna LU Weerakoon	Dir. IMD State Sec. Irrig	Study tour in South Korea and Indonesia		3 Weeks	26-8-91	13-9-91	14,411	No Change
TCT 383-000-1-61142 WGD Nimalaratna	ADA	Training in Planning and Management	DTCP Manila Philippine	3 Weeks	2-9-91	20-9-91	4,281	N/A
TCT 383-000-1-61132 S Jayasinghe	DD Finance	Trn. on Programing for Development	AIM Manila Philippine	3 Weeks	4-11-91	29-11-91	4,786	N/A
TCT 383-000-1-61150 UG Abeygunawardena SM Dharmatunga AMM sakitu KK Kiribanda RM Sunil Ganiini RP Tilakaratna DT Wijeratna RP Minie Sarath KA Rendias	PM Farmer do do do do do do	Study Tour to Observe Agricultural and Irrigation Schemes	AIT Bangkok	2 Weeks	30-9-91	13-10-91	21,040	No Change

TENDVS

TABLE V - 2  
OVERSEAS TRAINING - FUNDED BY USAID GRANT

Name of Participant	Designation/ Agency	Course	Institution	Duration	Period		Cost \$	Post training Assignment/ Remarks
					From	To		
ITCT								
IS83-080-1-62150								
IA Jabar	IPM	Study Tour Farmer	AIT	2 Weeks	11-5-92	26-5-92	37,625	N/A
IKBSK Semasinghe	IAO	Management Irrigation	Bangkok					
IPMW Bandaranayake	IDO	Systems in						
ILSP Silva	IDO	Thailand						
IUPK Perera	IDG							
IP Wanigasinghe	IDO							
IRP Ekanayake	IDO							
ILP Jayampathy	IPM							
IJ Jayasena	IPM							
IPK Sugunapala	IPM							
IK Kuruppu	IPM							
IGRAW Hemmatagama	ADA							
IHMA Dissanayake	IDO							
IRM Punchibanda	IDO							
ITCT								
IS83-080-1-62165								
IAMUB Alahakoon	IE	Study tour of	AIT Bangkok	3 Weeks	7-6-92	28-6-92	143,065	No Change
IBG Jemis Silva	Farmer	Farmer Representatives						
IACS Ibrahim	do							
IMNG Samarakoon	do							
IKM Karunaratna	do							
IAM Wijeratna	do							
IH Podiappuhamy	do							
IFGW Jayatilake	do							
IPG Nagoda	do							
IBG Babanis	do							
IO Karunaratna	do							
IGG Jayasena	do							
IDM Wijekoon	do							
ISM Yoosuf	do							
IAM Merza	do							
IDP Abesena	do							
IRM Mutubanda	do							

TRNOVS

## TRAINING PROGRAMS CONDUCTED DURING THE YEAR 1990 - 30 JUNE 1992.

Dec 15 to Jan 6, 90	IO Training	PM's Office Hingurakgoda
8-31 Jan.	TAA Trn. on hydraulic operations of Irrigation delivery systems	SLITTI
15-22 Feb 1990	IO Training	Anuradhapura
5-9 March 1990	TA Training Hydraulics on Irrigation Systems	SLITTI
24-26 May 1990	In-service Trn. course for WSS water management	SLITTI
May 1990	2 day trn. course for selected DCO members and IOs	Polonnaruwa
19 May to 6 Jun 90	IO Training	Kundasale
14-15 Sep 1990	TA Trn. course	SLITTI
19-24 Nov 1990	Trn. for FMA/MEF Asst.	Colombo
3-7 Dec. 1990	In-service Trn. for TAA	SLITTI
Jan. 1991	In-service Trn. for TAA/WSS	SLITTI
4-7 Mar 1991	FCG Reps. training	Polonnaruwa
Mar. 91 3 days	In-service Trn. for TAA/WSS/IOs	SLITTI
Mar 91 5 days	Trn. in Const. and quality control for WSS	SLITTI
27 Jan to 6 Feb. 92	IOs Training	ARTI
May 22 to Jun 30 92	VOCA Training Women Organization	Minneriya Scheme

- o Institutional organizers in-service training course
- o MEF/FM Assistants in-service training course
- o Technical Assistants in-service training Module I
- o Technical Assistants in-service training Module II
- o Technical Assistants in-service training Module III
- o Work supervision course - work organization
- o Field canal group representatives O&M course
- o Range Training Team Leaders Course for TAs
- o Operations management Course for TAs
- o Institutional Development Officers pre-service training
- o Enumerators Training for K.V.S.
- o Trainer Training Program in Financial Management
- o Computer Training for Water Management
- o Distributary Canal Management Training for CO Representatives
- o Training in Water Measurement to TAs

Some of the training that remains to be done at PACD is centered primarily on the Gal Oya RB and LB Systems. Additional training for IOs, NEE/FM Assistants and ECRs remain to be done and should be programmed using Irrigation Sector Assistance Tranche funds after PACD.

Overseas training was successfully completed in most areas, however, some participants could not avail the training either because of USAID English language requirements or the lack of time to accomplish or program the overseas training before PACD.

## 2.6. AGRONOMY/CROP DIVERSIFICATION

### 2.6.1 ACCOMPLISHMENTS IN CROP DIVERSIFICATION

Recognition and financial assistance extended upon crop diversification program under the ISM Project facilitated classroom training, field demonstrations and field tours, that made a start in changing the farmer attitude of rice mono-cropping.

Some farmers have realized through the demonstration and production activities done by them, that the net income and employment opportunities in other crop production is greater than from rice in spite of the higher cost of production.

There is an upward trend in acceptance of growing other crops. The production extent of other crops show an increasing change from 2% in 1987 to 10% in 1991 and an increase of 11% from 1990 to 1991.

### 2.6.2 INNOVATIVE STRATEGIES ADOPTED

Preparation of the cultivation plan at the field canal level was introduced to the project area. This has now become a base of information collection for the annual implementation program and for the monitoring evaluation and feedback program. This activity will enable farmers at the field canal level to collectively prepare a cultivation plan for the command area under their field canal. Adhering to the plan will minimize staggered cultivation,

encourage early crop establishment, collectively obtain inputs, timely application and to use appropriate technology. This will also save time and water while availing the land for another additional crop to push cropping intensity beyond 100%.

Zero tillage planting of pulse crop is a new innovation to the LSM Project area. The concept was introduced with the annual work plan 1990. Crops were planted in Ridi Bendi Ela average yield of 200 kg/ac and record yield of 400 kg/ac was obtained. The demonstration activity is continued and farmers are now looking forward for this innovation.

The OFC production during Maha in well drained paddy lands tried in Maha and late Maha season has shown dramatic income increases than in the case of rice. Net returns of Rs 10,000 from 1/15 ac onion and Rs 6,000 from 100 sq. meter of beetroot. Seed production and marketing is another innovation some farmer organizations have accepted and are testing. Now there are five farmer organizations that have moved into seed paddy production. Two have undertaken seed agencies in the DOA and other seed companies.

Some of the farm women moved in for mushroom production. Thirty farm women have been adequately trained to continued this innovation. Trained 175 volunteer farmers from all the established DCFO selected by them in General Agriculture. Farm machinery and equipment, crop production and plant protection. Arrangements have been made to continue with this training and for the volunteers to work in coordination with the DCFO and the Agricultural Extension Service.

Through the farmers organizations a series of the food crops production demonstrations were conducted in 1990, 1991\ and 1992. As these demonstrations have to be continued until late stages of the early adoption period, a revolving fund had to be developed.

The funds expended through the DOA for the farmer organization was to be reimbursed by the farmer who carried out the demonstrations. It was very successful in Gal Oya LB and in the Giritale and Parakrama Samudra schemes. In RBE Minneriya and Kaudulla, the rate of reimbursement was poor. This was due to reasons such as failure of onion seed supplied by the DOA.

Adverse weather conditions at the planting time in RBE and the incorrect information given by unknown persons, that the monies need not be reimbursed. Instructions were given to the PMs and ADs relevant that the reimbursed monies be deposited in a bank account under the SLFO and 90% can be obtained for future demonstration and recycled until late stages of early adoption period.

### 2.6.3 SUCCESSES AND SHORTCOMINGS

Although the concept of planning the cultivation season at the field canal level was introduced and tested under two field canals it was not adoptable due to the lack of continuous support from the field. In some cases the field canal group farmers lived a distance apart and would not attend group meetings. There seem to be a gap affecting the extension of the although the IMD has accepted and included this activity in the MEF Program.

In the zero-tillage planting program demonstrations are continuously carried out in the project area. It has been noticed that new varieties of seed introduced by the DOA for this purpose, mung bean; Harsha; cowpea TVU 946 and TVU 930 are three varieties ideally fitting in for this purpose. However, stray cattle is a menace for this program. Farmers growing such crops do not wish to fence their fields for a short period. Therefore cattle cause severe damage at times. The ISMP did not have adequate reasons to convince the farmers on the need of planting a crop in place of grazing cattle during such periods.

In the demonstration activities Minneriya and Kaudulla demonstrations were unsuccessful due to poor quality seed and false information on the recovery of the funds.

Although mushroom production training was successfully carried out for farm women in Minneriya it cannot be continuously carried out by them due to the short supply of mushroom spawns. The spawn production center is located at Ratmalana in Colombo, 215 km. away. Suggestions have been made and financial allocations are made to the DOA Polonnaruwa to conduct the necessary training on spawn production. A production laboratory must be set up in the proximity.

The seed production and marketing activity commenced very recently and is successfully going on and it is difficult to comment on.

Attention of NGOs such as Grain Elevators and Plenty Canada has moved in for contract growing of soy bean while the Agro-chemical companies have moved into carry out adaptive research in the use of pesticides. The seed companies also have consented to move into carry out adaptive type of research in new varieties of crops with the farmer organizations. Seed samples from tropical seeds have already been distributed among all schemes.

Weekend extension service, specially in Polonnaruwa, was unable to meet with the demand of ISMP Agriculture extension activities. There was a general discouragement of the extension field officer due to lack of incentives for their inputs.

#### 2.6.4 STATUS OF CROP DIVERSIFICATION AT PACD

It has been accepted by most of the relevant authorities that production of other crops in well and imperfectly drained paddy lands during Yala is of great importance to increase net farm income. Continued Government support is expected in terms of finance and extension advice to the farmer organizations. Some farmers within the project have experimented with zero-tillage planting of short duration pulse crops and are convinced and looking forward to extend. But stray cattle during the rice fallow season is the biggest constraint against this activity. The farmer organizations must seek advice to plan the fallow season to suite grazing and to grow an interim crops in suitable areas. This innovation has been carried out in all the schemes of the project. Training and demonstrations have also been conducted at several instances in processing pulse seed for dhal. This gives an added value to what the farmer produce.

The extent of other crop production have increased during the project period during Yala 1992 the extent has a tendency to increase due to the shortage of water during the dry season. However, there will be a delay in planting while only short duration pulse and vegetable crops will be grown.

Planting of other crops during Maha and late Maha is a success in Ridi Bendi Ela with vegetable crops. This is another innovation with high success and should be replicated in other project areas to fetch higher levels of incomes during the lean periods. Growing mushrooms in women farmer organizations has one big constraint to make the project stagnant.

Seed production and marketing was started very recently so its too early to comment.

#### 2.7 RESEARCH

##### 2.7.1 ACCOMPLISHMENTS

The Research Component was entrusted to the International Irrigation Management Institute (IIMI) through a Cooperative Agreement signed in June 1987 and extended in June 1990 to the end of the project. Under the Cooperative Agreement, IIMI is responsible for contracting and overseeing research on particular topics as selected by the ISMP Research Advisory Committee.

Table VII-1: Studies Completed under ISMP Research Component

<u>Cost</u>	<u>Study</u>	<u>Firm</u>	<u>Completion</u>
<b>Major Studies</b>			
Rs 810,306	1. Calibration of Water Delivery Systems in Irrigation Schemes in Polonnaruwa	Lanka Hydraulics Ltd	June 1990
Rs 1,565,606	2. Institution Building in Four Irrigation Schemes in Polonnaruwa	TEAMS (Pvt) Ltd	Sept 1990
Rs 420,840	3. Water Management Projects in Nagadeepa, Mahawewa and Pimburettewa Systems	Associated Development Research Consultants	Dec 1990
Rs 1,264,428	4. Operations and Maintenance Costs	TEAMS (Pvt) Ltd	May 1991
Rs 569,100	5. Maximizing Profitability of Irrigated Agriculture in the Polonnaruwa Systems	Agriculture Industry Consultancy and Services (Pte) Ltd	July 1991
Rs 1,172,152	6. Turnover of O&M on Distributaries to Farmers Organizations in Polonnaruwa	TEAMS (Pvt) Ltd	Mar 1992
Rs 1,788,000	7. Cost Effective Irrigation Modernization Strategies for the 1990's	Engineering Consultants Ltd/Associated Development Research Consultants	June 1992
<b>Minor Studies</b>			
S 2000	8. Rehabilitation of Irrigation Systems in Sri Lanka: A Literature Review	Dr. WAT Abeysekera	Dec 1991
c. S 2000	9. Contracting with Farmer Organizations for Rehabilitation Works	IIMI	June 1992

Accomplishments of the research component include the seven major research studies shown in Table VII-1.

In addition, two smaller research studies were carried out (see Table VII-1). The study on rehabilitation of irrigation systems was commissioned to provide background for the major study on cost effective modernization. The study on contracting with farmer organizations was taken up to provide guidelines for officers on contracting with farmer organizations; this is a pressing problem facing rehabilitation work in Sri Lanka. It is being done with funds from IIMI's personnel and office supplies line items.

Each of these studies resulted in a report that was distributed widely within Sri Lanka. The results also were discussed at national level workshops. In addition, the results formed the basis for the following formal IIMI publications (all to appear in 1992):

1. Flow Measurement at Drop Structures, R. Sakthivadivel and D. Merrey, IIMI Country Paper
2. NGOs in Irrigation Management, D. Merrey, K. Atukorala, and T. Atukorala, IIMI Country Paper
3. Rehabilitation of Irrigation Systems in Sri Lanka: A Literature Survey, W.A.T. Abeysekera, IIMI Country Paper
4. Guidelines for Cost Effective Modernization of Irrigation Systems in Sri Lanka, IIMI Country Paper
5. Contracting with Farmer Organizations for Rehabilitation Work, J. Brewer and R. Ekanayake, IIMI Working Paper

#### 2.7.2 INCORPORATION OF RESEARCH RESULTS INTO ISMP ACTIVITIES

Some results of the research program were incorporated directly into ISMP activities. These included:

1. The data and techniques developed under the study of water delivery systems were incorporated into ISMP training programs on water measurement.
2. Findings on the costs of operations and maintenance formed the basis for modifications and development of the ISMP maintenance program.

However, most of the research subjects identified the Research Advisory Committee were not derived from problems faced by ISMP implementors. The subjects instead were ones associated with operations and maintenance that would follow completion of the project. Also, the findings generally applied to more than the seven ISMP systems. Thus, many results of these studies were incorporated into the Irrigation Management Policy Support Activity (IMPSA) papers and into other policy decisions beyond the immediate

scope of the ISMP. These included:

3. The findings of the institution building study and the turnover study have served to strengthen the government's commitment to participatory management of irrigation schemes as laid out in the IMPSA papers.
4. The results of the study at Nagadeepa and Pimburettewa have made clear the inadequacy of relying solely on NGOs for organizing farmers.
5. The operations and maintenance cost study findings have played a part in determining the way in which turnover of O&M responsibilities to farmer organizations is carried out.
6. The O&M cost study findings have also alerted many persons to the high percentage of funds for O&M that go for establishment costs rather than for actual activities.
7. The study on maximizing profitability of irrigated agriculture in Polonnaruwa has provided additional evidence to policy makers on the stagnation of paddy yields in Sri Lanka.
8. The findings of the cost effective modernization strategies study will help the government to plan and carry out rehabilitation/modernization projects in a more effective way in the future, most immediately in the National Irrigation Rehabilitation Project.

#### 2.7.3 SUCCESSES AND SHORTCOMINGS OF THE RESEARCH PROGRAM

As specified in the Project Paper, the ISMP research program has two objectives:

1. to increase Sri Lanka's institutional capacity to conduct research,
2. to find causes and solutions to problems which must be solved if the overall objectives of the ISM Project are to be accomplished.

As described in section 2.7.2, the research program has had some small success in solving problems for ISMP. However, the major effects of the research program have not been within the project but rather in affecting the policy environment.

The research component has also had some success in increasing institutional capacity within Sri Lanka to conduct irrigation management research. Initially it was felt that the project should confine support for research activities to public institutions, including government institutes and universities. Despite efforts to solicit proposals from such institutions in 1987 and 1988, none were forthcoming. Beginning in 1989, therefore, research activities were opened to private firms.

The result has been that five such firms undertook research under this component. Of those, two - TEAMS and Associated Development Research Consultants - got their first corporate research experience through this program. The others benefitted through their association with IIMI and the ISMP in the capacity. Although there have been criticisms - many of which have been valid - levelled at several studies, this program has succeeded in creating or upgrading research capacities in these five firms.

The most important success of the research program, however, may have been the wide dissemination it gave to lessons from ISMP. Through workshops on the studies, distribution of reports, IIMI publications, and use of the results by IIMI scientists and others, various aspects of the ISMP experience became widely known throughout Sri Lanka.

#### 2.7.4 STATUS OF THE RESEARCH PROGRAM AT PACD

At PACD, all of the funds contained in the IIMI Cooperative Agreement have been expended and all of the studies identified by the Research Advisory Committee have been completed, except certain follow-on studies to the study on maximizing profitability of irrigated agriculture. A small amount of funds contained in the IIMI's Agreement for personnel have also been used to undertake an additional study on contracting with farmer organizations that may be of use to government officers in the future.

Purpose b) of the ISMP, as stated in the Project Paper, is to "test and demonstrate the effectiveness (cost vs. benefits) of different combinations of management and structural improvements carried out in selected irrigation systems." PIL 27 modified this purpose through "focusing on finding the most long term cost effective methods and techniques for system rehabilitation and sustained maintenance, building effective farmer organizations and institutions, and linking these elements to work together for a common goal." In addition, the distinction between "essential structural improvement" and "pragmatic rehabilitation" was eliminated.

The ISMP had originally been designed to provide data and findings about "different combinations of management and structural improvements" by providing those different combinations to different irrigation systems. The changes wrought by PIL 27 largely eliminated the differences. Therefore, satisfying purpose b) of the ISMP as defined in the Project Paper now relies mainly on the research activities managed by IIMI and specifically on the Study of Cost Effective Modernization Strategies.

#### 2.7.5 CONCLUSIONS AND RECOMMENDATIONS

These experiences suggest the following:

1. For the first two years of the project, public sector research institutions, including government institutes and universities, found it difficult to put together proposals for

research for the project. The various troubles in the country during 1988 and 1989 were partly to blame. On the other hand, private firms proved to be extremely responsive to offers for research contracts. Future research activities should be open to both private and public firms and institutions; contracts can be awarded through competition.

2. The research program proved to be the major means for disseminating lessons from ISMP throughout the irrigation community in Sri Lanka. In part this was due to IIMI's other contacts with irrigation specialists but in larger part it was because the research program provided for wide dissemination of results through workshops and publications.
3. ISMP research results have been very important as support for policy changes now going on in Sri Lanka. This is, in part, a product of the research subjects identified by the Research Advisory Committee. The importance of the research results for policy was not foreseen by the project designers.
4. The management of the component by IIMI has been important to the activity not so much because of the value of the results but more importantly because a) IIMI, as a research institution, has been in the position to provide guidance in the research process, and b) IIMI, as a Sri Lankan based institution, has the confidence of a variety of government personnel and private persons and has the means to disseminate the results locally. This suggests that such research activities will have a higher likelihood of useful results if overseen by similar institutions.

## 2.8 COMMODITY PROCUREMENT

### 2.8.1 ACCOMPLISHMENTS

The original commodity procurement requirements were outlined in the ISM Project Design Report and later included into the Project Paper. The list of equipment in the Project Paper included a lot of heavy equipment similar to that ordered under the Gal Oya Water Management Project. Since the Gal Oya RB System was not started at the beginning of the ISMP due to civil unrest in the Ampara District, the original list of heavy construction equipment was reduced considerably in late 1987 from the list approved in the Project Paper. Originally, about 4.865 million dollars was allocated for construction equipment, O&M equipment, vehicles, engineering field equipment, micro computers, audio visual equipment, air conditioners, photo copy machines, etc; however, with the revised list reducing a large amount of construction equipment, the budget of items to be procured was reduced to about 1.855 million dollars or a reduction of about 60%.

A list of the original procurement equipment envisioned in the Project Paper and that prepared at the beginning of the Project is presented on Table 2-8-1. Table 2-8-2 presents the first procurement list for the 1988 Annual Work Plan.

Essentially there were six major categories of procurement items namely:

1. Construction and O&M Equipment (Tractors, Compactors, Graders, etc.)
2. Vehicles, Motor Bikes and Bicycles.
3. Field Engineering Equipment (Current Meters, Survey Instruments, etc.)
4. Office Equipment (Typewriters, Photo Copy Machines, Micro Computers, Air Conditioners, etc.)
5. Training Aids (Audio Visuals, Projectors, TV, etc.)
6. Office Furniture, Library Books, Miscellaneous Equipment

The actual procurement list varied somewhat from the original. LOP procurement list and adjustments were made by adding or deleting some equipments over the LOP.

A summary presenting information on equipment items procured each year of the Project is presented in Table 2-8-3.

### 2.8.2 SUCCESS AND SHORTCOMINGS

One of the major deficiencies in the procurement program was in the procurement of micro-computers which were primarily purchased for the Computer Assisted Water Management Model for improving ID

## Irrigation Systems Operations.

This was a major requirement under the O&M Component of the Project, as the computers purchased were to be used for implementing the Computer Assisted Water Management Model. Computers purchased for the Program were of inferior quality and were broken down most of the time resulting in major problems with implementing the Improved System Operation Program during the LOP. At PACD only one computer in the Polonnaruwa Range was in full operation and parts of the other three units were not useable or had to be exchanged to the useable computer. The cost of the repairs and replacements for parts for these computers have been too excessive for ID to maintain, therefore, after the Project the sustainability of the four computers is questionable and this will therefore have a great impact on the continuation of the Computer Assisted Systems Operation Water Management Program after PACD.

### 2.8.3 STATUS OF PROCUREMENT AT PACD

The status of the actual items procured over the LOP is presented on Table 2-8-4 and the expenditures incurred in the procurement presented on Table 2-8-5 under the categories of funding by USAID Grant, USAID \$ Loan and GOSL Rupees. Only about 27% of the funds originally allocated for the Commodity Procurement Component were utilized; this was primarily due to the considerable reduction of construction equipment as original planned in the Project Paper.

TABLE 2-8-1

LOP COMMODITY PROCUREMENT LIST  
USAID FUNDED

I.T.E.M.	OAH	FO	FM	EIF	YCE	RES	Total No.	Cost Unit	(\$ 1,000) Total
<b>MAINTENANCE EQUIPMENT</b>									
Front-end loader, 45 hp	6						6	57.00	342.0
Vibratory Roller, hand	6						6	7.80	46.8
Backhoe, large, 80 hp	2						2	65.00	130.0
Backhoe, small, 50 hp	6						6	45.00	270.0
Concrete Mixer, 5 hp	6						6	7.80	46.8
Farm tractor-trailer, 45 hp	32						32	11.00	352.0
Tractor, 45 hp, bowser	6						6	32.50	195.0
Crawler tractor, 100 hp	10						10	78.00	780.0
Low-bed trailer	1						1	15.00	15.0
Spare parts	(\$135.5)								435.5
Sub-total									2613.1
<b>TRANSPORTATION</b>									
Jeeps, Double cab pickups	18	1	1	3*	2		24	10.00	240.0*
Motorcycles	31	9		18*			50	1.20	60.6
Bicycles		300					300	0.12	36.0
Spare parts	(\$52.8)	(\$2.2)	(\$1.6)	(\$7.6)	(\$4)				68.2
Sub-total									413.8
<b>FIELD/OFFICE EQUIPMENT</b>									
Current meters	18						18	2.00	36.0**
Theodolites	6						6	4.00	24.0**
Levels	6						6	1.20	7.2**
Audio-visual training aids					2		2	9.20	18.4**
Drafting equipment					2		2	2.00	4.0
Video Recorder					4		4	0.80	3.2**
Color TV					4		4	0.70	2.8**
Photocopier	5				2		7	3.80	26.6**
Typewriter	8						8	1.50	12.0**
Air conditioner	14						14	1.20	16.8**
Micro-computer	6				2		8	14.00	112.0
Library acquisitions					4		4	7.00	28.0
Office equipment		(\$10)	(\$5)	(\$10)					25.0
Miscellaneous small equipment		(\$20)				(\$12)			32.0
Sub-total									348.0
* To be allocated among participating agencies							<b>T O T A L</b>		3374.9
** Grant financed equipment (five vehicles plus field/office equipment marked) Total value \$200,000									=====

NOTE: 1. Source: Project Authorization Paper, dated 25 August, 1986

2. The commodity procurement list is under review by I&D/ID/USAID/S&I.  
Revisions will be incorporated in revised LOP and annual work plans.

TABLE 2-8-2

FIRST PROCUREMENT INSTALMENT - 1988 WORK PLAN  
(Revision No. 1)

COMMODITY PROCUREMENT LIST

EQUIPMENT TO BE PURCHASED BY SAI FROM OFF-SHORE SOURCES

CODE	ITEM	NUMBER	EST. COST Rs.
Ø9(1)vi	Library Requirements *	Various	500,000
Ø9(3)i	Current Meters	9	600,000
ii	Theodolite	1	150,000
iii	Automatic Levels	15}	
	Hand Levels	40}	600,000
iv	Audio-Visual Training Aids *	Various	300,000
vii	Hand Probe Density Tester	40	200,000
viii	Hand Mechanical Compactor	40	600,000
SUB-TOTAL			2,950,000

\* Some items may be purchased locally by ID

EQUIPMENT TO BE PURCHASED LOCALLY BY IMD/ID

Ø9(1)i	Photocopiers	4	640,000
ii	Typewriters	8	290,000
iii	Air Conditioners	8	320,000
iv	Micro Computers	7	1,500,000
v	Office Equipment and Furniture, etc.	Various	700,000
Ø9(2)	Vehicles		
1	Jeeps-Double Cab-Cars	8	3,200,000
ii	Motorcycles	19	1,100,000
iii	Bicycles	124	300,000
Ø9(3)v	Video Recorder	4	120,000
vi	Colot TV	4	100,000
SUB-TOTAL			8,270,000
T O T A L .			11,220,000

NOTE: Above estimated costs include customs duty, B.T.T., handling

8.0 COMMODITY PROCUREMENT

TABLE 2-8-3  
STATUS OF COMMODITY PROCUREMENT OVER LIFE OF PROJECT

No	LIFE OF PROJECT ITEM	Procurement				1992 Procurement	
		LOP Quantity	Procured end of 1988	Procured end of 1989	Procured end of 1990	Procured to end of 1991	1992 Program
1	Front End loader	1	-			1	1
2	Back Hoe With Shovel	1	-			1	1
3	Concrete vibrator with engine	4	-	4	4	4	4
4	Concrete Mixer 5/7 Cuft.	6	-				6
5	Farm Tractor / Trailer	15	-	6	12	8	8
6	Farm Tractor / Water bowser	5	-	5	3	4	4
7	Air Compressor 300 Cuft/min w/e J/HMRS.	1	-			1	1
8	Pumps Half Cusec bellow type	4	-	4		4	4
9	Crawler Tractor 90/1000 HP with Dozer	1	-			1	1
10	Generator Set with engine 1.0 KVA	6	-			1	4
11	Boom for Cat 225 Back Hoe	1	-				2
12	Hand Operated vibrator & R/Tamping Roller	2	-			1	
13	Hand Held Compactors & Vibrating Hammer	40	-	40			1
14	Motor Grader w/one add/tyre set	1	-		16	40	
15	Pajero Type Jeeps	16	-	16	1	1	5
16	4 WD Doble Cab	13	-	1	2	16	
17	Motor Car	Lot	-	1		8	Remainig
18	Spares for above equipment	Lot	-		Lot	2	Part
19	Spares for Gal Oya Equipment	18	-	Lot	9	Lot	9
20	Current Meters	1	-	9	1	Lot	Lot
21	Theodalite	15	-	1	15	9	Lot
22	Levels with Accessories	40	-	15	40	1	
23	Hand Levels	4	-	40	4	15	
24	Photo Copier	6	-	4	6	40	
25	Typewrite Electronic English Std	2	-	6	2	4	
26	Typewrite Manual English Std.	2	-	2	2	6	
27	Typewriter Manual Sinhala Std.	8	-	2	7	2	1
28	Micro Computer	14	-	7	7	2	
29	Air Conditioners	4	-	7		7	2
30	Color Television Sets	4	-			7	2
31	Video Cassette Recorders	Lot	-		Lot		Lot
32	Audio Visual training Aids, Cameras, ACCS	2	-	Lot			2
33	Slide Projector etc.	127	-		58	Lot	69
34	Motor Cycles	300	-	19	152		47
35	Bicycles	10	-	92		58	10
36	Drafting Equipment	Lot	-		Lot	160	Lot
37	Office Equipment - furniture etc.	Lot	-		Lot		Lot
38	Library Requisites	100	-	100	100		
39	Mosquito Nets	100	-	100	100	100	
40	Leather Nets	19	-			100	19
41	Hand Held Walkie Talkie Radio Sets	Lot	-				Lot
42	Workshop Equipment	Lot	-				Lot
43	Misc. Small Equipment	Lot	-				

151

TABLE 2-8-4  
STATUS OF COMMODITY PROCUREMENT AS OF 30 JUNE 1992

o.	ITEM	LOP Quan- tity	Pro- cured to end of 91	1992 procurement	
				1992 Program	Procured to 30-6-92
1	Front End Loader	1	1		
2	Back hoe with shovel	1	1		
3	Concrete Vibrator with Engine	4	4		
4	Concrete Mixer 5/7 Cuft.	6	--	6	6
5	Farm Tractor/Trailer	15	8	7	7
6	Farm Tractor/Water Bowser	5	4	1	1
7	Air Compressor 300 Cuft/min w/3 J/Hrs.	1	1	1	
8	Pumps half cusec bellow type	4	4	--	
9	Crawler Tractor 90/100 HP with Dozer	1	1	1	
0	Generator Set with engine 1.0 KWA	6	--		
1	Boom for Cat 225 back hoe	1	1	--	
2	Hand Operated Vibrator & tamping roller	2	--	2	
3	Hand held Compactors & Vibrating Hammer	40	40	--	
4	Motor Grader w/one addl/tyre set	1	1	--	
5	Pajero type Jeeps	16	16	--	
6	4 WD Double Cab	13	8	5	5
7	Motor Car	2	2	--	
8	Spares for above equipment	Lot	Lot	Remaini	Lot
9	Spares for Gal Oya Equipment	Lot	Lot	Part	Lot
0	Current Meters	18	9	9	
1	Theodolite	1	1	--	
2	Levels with Accessories	15	15	--	
3	Hand Levels	40	40	--	
4	Photo Copier	4	4	--	
5	Typewriter Electronic English Std.	6	6	--	
6	Typewriter Manual English Wide	2	2	--	
7	Typewriter Manual Sinhala Std.	2	2	--	
8	Micro Computer	8	7	1	
9	Air Conditioners	14	7	--	
0	Color Television Sets	4	--	2	
1	Video Cassette Recorders	4	--	2	
2	Audio Visual Training Aids,Cameras.Accs	Lot	Lot	Lot	Lot
3	Slide Projector etc.	2	--	2	
4	Motor Cycles	127	58	60	
5	Bicycles	300	160	47	
6	Drafting Equipment	10	--	10	
7	Office Equipment - furniture etc.	Lot	--	Lot	
8	Library Requisites	Lot	--	Lot	
9	Mosquito Nets	100	100	--	
0	Leather Bags	100	100	--	
1	Hand held Walkie Talkie Radio Sets	19	--	19	
2	Workshop Equipment	Lot	--	Lot	
3	Miscellaneous Small Equipment	Lot	--	Lot	

Note: Item Nos. 5+6:- 12 Farm Tractors, 8 Tractor Trailers and 4 Trailer Bowsers were procured to end of 1992.

7 Tractor Trailers and 1 Trailer Bowsers procured under 1992 program

8 Farm Tractors to be procured under 1992 program.

PROCURE

VIII-1

152

TABLE 2-8-5

COMMODITY PROCUREMENT EXPENDITURES  
AS OF 30 JUNE 1992

FUNDING SOURCE	AUTHORIZED	EXPENDED TO 31 MARCH 1992	PERCENTAGE EXPENDED
GRANT	\$104,000	\$78,707	75.7
LOAN	\$1,231,166	\$1,032,455	83.9
GSL	Rs. 15,392,000	\$22,094,000	143.5

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153

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## 111 MAJOR PROJECT DECISIONS AND EVENTS

### 3.1 GOSL ALLOWS FO's TO UNDERTAKE CONSTRUCTION CONTRACTS

In mid-1988 the then Director IMD, Mr.D.G. Premachandra agreed to allow the DCFOs in the four Pilot Areas in the Polonnaruwa Schemes to take construction contracts on the field channels of those DCFO areas up to a maximum of Rs.250,000 except for the Giritale Pilot Area(Chandana Pokuna DCFO) all other Schemes in Polonnaruwa Range, Minneriya, Parakrama Samudra and Kaudulla Schemes undertook construction contracts in the Pilot Areas namely, Kusumpokuna DCFO in Minneriya Scheme, CP Pura Pokuna DCFO in Kaudulla Scheme and Damana Gemunupura DCFO in Parakrama Samudra Scheme.

At that early stage of FO development, the DCFOs were not strong enough to undertake these contracts. No provisions had been pre-panned by the ID to assist the DCFOs in construction management and quality control. Therefore, it was a very difficult task to make progress. Furthermore, civil disorder prevailed in Polonnaruwa District in late 1988 and early 1989 making the initial effort of the FOs in the rehabilitation of their FC's even more difficult. The result of this situation was that these contracts were not completed in 1988. They were carried into 1989 and even into 1990, in some areas. Therefore, the first effort of the DCFOs to undertake construction contracts was a failure.

Subsequently, however, ID and DCFO officers and representatives initiated planned training programs in construction management and quality control. This considerably enhanced the construction capabilities of the DCFOs and prepared them for undertaking construction contracts in the rehabilitation of their Distributary Canal System. During 1989 and 1990, the performance of the DCFOs in rehabilitation improved remarkably, with the assistance of ID staff. Considerable progress was made because of their efforts in the rehabilitation of the FC in their respective DCFO area. The quality of their work improved considerably. In 1991, they were allowed to take over D-canal construction as well as FC construction covered up to Rs 750,000 (3 x Rs. 250,000).

It can be concluded from this major decision, made by the Director of IMD in 1988 that if the Farmer organizations are strong, well organized and have received some training in construction management and quality control that they are capable of undertaking rehabilitation contracts.

### 3.2 USAID ASSESSMENT REPORT - 14 DECEMBER 1988

In November 1988, USAID assigned a four person Assessment Team to assess the status of ISMP and to identify areas of weakness for appropriate corrective measure.

A report was submitted by this Assessment Team which had a great impact on the future performance of the TA Team as well as the implementation of several components of the Project. Some of the changes made were a result of this Assessment Report, which directly improved the TA performance and fostered major changes to the implementation procedures of some of the Project components, they were:

- o Recommendation - The Report requested that the Sheladia Chief-of-Party (COP) be posted to Polonnaruwa to provide leadership and to install an interdisciplinary approach to the Sheladia TA Team.

Sheladia agreed with his recommendation and the new COP Mr. W.J. Leatham, who replaced the first Sheladia COP was assigned to Polonnaruwa in August 1989. Considerable improvement in the TAs team performance was achieved by this move.

- o Recommendation - The duration of the Sheladia's F.O. Specialist and MEF Specialist assignments were insufficient to carry out and effectively implement these two Components. Therefore it was requested by the Assessment Team that the length of service of these two positions be extended.

Although Sheladia's expatriate F.O. Specialist departed as originally scheduled, Sheladia extended the local F.O. Specialist from 24.00 to 37.56 person-months and eventually assigned another local F.O. Specialist primarily for Gal Oya for another 28.39 person-months to meet the recommendations on F.O. For the MEF Component, the Expatriate MEF Specialist was extended 3 person-months and a local MEF Specialist assigned to carry on after the departure of the Expatriate for another 12 months. Eventually a third MEF Expatriate Specialist was assigned for two-short term assignments totalling 3.81 person-months to finalize the MEF Program before PACD. This third Consultant assists IMD in getting in place the appropriate MEF System for the ISMP and INMAS. The additional person-months added for the F.O. and MEF Specialists made a great impact in achieving the objectives of those two Components.

- o Recommendations- In the early years of the Project Graduate IOs did not remain on the Project. Therefore, it was recommended that recruitment of lower academic standard personnel be endorsed to reduce the attrition rate. The Assessment Team also endorsed the selection of volunteer IOs from the Project area and recommended payment for those IOs. This recommendation was carried out by IMD and Probationary IOs were appointed from within the areas of each Scheme. This was highly successful and most of those IOs stayed with the Project until the end, thus eliminating the attrition rate minimized added training requirements and costs.

- o Recommendations - A major Project purpose was to test and demonstrate the effectiveness of different combinations of management and structural improvements carried out in various selected Major Irrigation Schemes. This was not specifically addressed in the Project Paper and or in the TA Teams Scope of Work. Therefore the TA contract should be modified or adjusted to include the important comparative analyses, to allow the study to be concluded by PACD.

The TA Consultant accepted this additional work within the Contract and its Economist initiated work on the Economic-Cost Effective Analyses. A Report on the approach to be taken was prepared and submitted to USAID. Subsequently the Mid-Term Evaluation recommended that this study be provided under one of the ISMP Research Studies. This recommendation was accepted and IIMI engaged a local Consultant to prepare a Study on Cost Effective Irrigation Modernization Strategies for the 1990s. This study was successfully completed by PACD to achieve the purpose stated in the Project Paper.

- o Recommendations - Gal Oya RB and LB Schemes has yet to be implemented under the Project due to the security situation, and a decision should be made by March 1989 on whether to implement the ISMP Program there or drop it and go to another area or to concentrate strictly on Polonnaruwa.

The TA team was instrumental in setting up the first inspection trip to Gal Oya in April 1989 along with two USAID Officers. Based upon that inspection it was decided to initiate ISMP in Gal Oya RB and LB Schemes in Mid 1989. The TA Contractor set up a TA Team in Ampara in January of 1990 and work was proceeding satisfactorily until July 1990 when civil disturbance caused the Consultant to remove its personnel. However, the IMD/ID continued to implement the planned Program, but on a slow schedule. Subsequently Pragmatic Rehabilitation and Preventative Maintenance funds slated for Gal Oya were re-allocated to Polonnaruwa and to the new approved Preventative Maintenance work for the RBE Scheme in the Kurunegala Range, even though work in Gal Oya continued, but on a very slow pace. Some of Sheladia's TA staff returned to Ampara in early 1991 and continued to assist the implementation of the O&M and FO Programs up to PACD. Although the decision to start work in Ampara could be questioned, work has been carried out to keep effectiveness from mid-1989 to PACD and some accomplishments in FO and O&M achieved.

However, at PACD, considerable work in rehabilitation and development work remained to be accomplished.

### 3.3 ISPAN PROJECT REVIEW WORKSHOP - APRIL 1989

A four day workshop was held in April 1989 to review the present status of the Project, identify problems and means to solve the problems, and to plan for future Project implementation work. Interviews were held by the ISPAN Review

Team prior to the workshop and a workshop agenda developed with ID/IMD/USAID and Sheladia representatives. The workshop was to cover a review of all Project Components, plus policy and project management requirement.

A summary of the major results and agreements made during the workshop by component follows which had an effect in changing the approach to implementing some, if not all of the Project Component.

### 3.3.1 Farmer Organizations must be legalized

- o The Farmer Organizations must be legalized if they are to engage in activities other than O&M so that they can negotiate loans with banks for their development activities.
- o Farmers participation in Distributary and Field Canal O&M can be improved with training in O&M. Special training should be provided at the Field Canal Representative level so that the representatives can train the farmers in their field canal groups.
- o The F.O. Development concept focus on FC Groups with all farmers of the FC Group a member of the DCFO.

### 3.3.2 Operations and Maintenance

- o Any field channel serving 60 acres or more will be implemented using project funds for structures and earthwork; all FC below 60 acres service area will be funded for structures only with the farmers performing the earthwork without payment.
- o The DCFO will be allowed to receive rehabilitation contacts up to the Rs. 250,000 limit provided they perform earthwork in those canals with less than 60 acre service areas.
- o The DCFOs are willing to take over the O&M rehabilitation of their Distributary Canal Systems, provided they have legal recognition and the systems are handed over to them by ID.

### 3.3.3 Financial Management Improvements

- o The focus on F.M. should be active farmer involvement in the collection of O&M fees and the proper management of these funds after collection. An FM Assistant should be assigned to the Project Manager's office for training of trainers in FM.

### 3.3.4 Monitoring, Evaluation and Feedback

- o A full time Deputy Director should be assigned by IMD to set-up the MEF program to monitor the DCFOs on a monthly and seasonal basis. MEF Assistants should be assigned to each PM office to carry out the program.

### 3.3.5 Training Capacity Enhancement

- o More training should be provided to Project Managers in Management and Administration. The training of IOs should be evaluated and further training needs identified.

### 3.3.6 Research

- o Research programs are all behind schedule and close monitoring of on-going progress by IIMI is required to accelerate the Research Components work.

### 3.3.7 Procurement

- o Procurement activities are behind schedule. Closer communications, more meetings and the monitoring of the procurement is needed to accelerate the procurement program.

Most of the recommendations made at these ISPAN Workshop were implemented and had a major effect in improving the implementation of the various components and achieving Project objectives.

## 3.4 ISPAN MID-TERM EVALUATION - JULY 1990

USAID requested Irrigation Support Project for Asia and the Near East (ISPAN) to conduct and evaluation of ISMP. The evaluation conducted at the approximate Mid-point of the Project Life (57%) was carried out to assess Project progress and to propose detailed and specific recommendations intended to provide guidelines and directions for the remaining Project activities.

The major conclusion and recommendation made during the Mid-Term-Evaluation were:

- o Conclusion - The rehabilitation efforts on the Project can not be completed by PACD (30 June 1992) due to wide spread civil unrest in the Project areas. Farmer Organizations, O&M program sustainability and long-term developments would not be achieved if the Project was to be terminated at PACD. In addition one of the Major Project purpose of sustained renewal of the Irrigation Systems would not be achieved since 65% of the rehabilitation works would remain to be completed at PACD. Furthermore the assistance and training needed for the DCFOs in carrying out O&M activities of their Distribution Canal Systems would not be accomplished by PACD.
- o Recommendations- An extension of the LOP of the ISMP was recommended by the Mid-Term Evaluation Team for a period of two years in order to overcome the negative conclusions stated above.

Many other recommendations were made during the Mid-Term Evaluation relative to each component and those recommendations were instrumental in helping accelerate and improve the work. These recommendations, by Component are presented under Exhibit 3-4-1.

### 3.5 GOSL GRANTING LEGAL RECOGNITION TO F.O.

Originally constituted DCFOs are registered with the IMD and DDI to obtain official status. The registration with DDI allows them to be considered for construction contracts. The Agrarian Services (Amendment) Act No. 4 of 1991 provided Farmer Organizations with the necessary legal recognition and statutory powers as a corporate body. This is a turning point in the history of farmer organizations in Sri Lanka.

The Agrarian Services (Amendment) Act No. 4 of 1991 Section 56 B, states the following:

"Provided that the Commissioner may register a Farmers Organization in any area under a Major Irrigation Scheme with the concurrence of the Secretary to the Ministry of the Minister in charge of the subject of Irrigation.

(2) From and after the date of registration of a Farmer's Organization under subsection (1) such organization shall be a body corporate with perpetual succession and a common seal and may sue and be sued by the name by which it is registered".

Each Farmer organization shall consist of at least twenty five owner cultivators or occupiers or one fourth of the total number of owner cultivators an occupiers of agricultural land in such areas to become a legal entity for registration to make an application to the Commissioner.

There are 60 DCFO registered under Section A and B and 78 DCFOs have been registered under only Section A. Those who registered under Section B are involved in agri-business activities. Most of the DCFOs are supplying agro-inputs to the farmers and some will buy back their produce. There are several organizations who are now seeking bank assistance to obtain credit for starting paddy mills and other agro-processing industries.

The IMD should make arrangements with the DCFOs to have them stipulate certain rules and regulations with regard to water allocation and distribution, clearing and maintenance of canals and other irrigation requirements. If some water users violate such rules and regulations, the farmer organizations will soon find themselves in virtually a helpless position because of the absence of proper legal provisions and mechanisms to deal with such cases.

### 3.6 GOSL DECISION TO HAND-OVER DISTRIBUTION CANALS TO FOS

On January 13, 1989, an order by the Director of Irrigation was circulated to all Range Deputy Directors to begin the hand-over of Distributary Canals to the Farmer Organizations who have formed and who were in a position to take over the responsibilities of operating and maintaining their D-Canals and F Canals (See Annex VIII).

This was a major Government decision and because of the strong FO Development Program under the ISMP, the turnover of Distributary Canals started in 1989 with a simple non-official hand-over ceremony and instructions to several DCFOs in the Polonnaruwa Range. The initial hand-over ceremonies was carried out on August 18, 1989 in four DCFOs in Minneriya Scheme; they were Divulankadawela, Vuharamawatha, Kusumpokuna Mahasen and Kusumpokuna DCFOs. After that date some 76 D-Canals out of 130 in the four Polonnaruwa Range Schemes and RBE Scheme in Kurunegala Range were handed over to the DCFOs by early 1990.

During the initial hand-over period the ID requested the DCFOs to take over the responsibility of maintenance, however, ID would still contribute maintenance funds to the DCFOs. Also, technical assistance by ID would continue to be provided for assisting them in the maintenance of their D and F canals. However, at the time of this initial hand-over the ID was still responsible for the operations of the Distributary Canal System and the process of turn-over of the operations to the DCFOs was delayed until training could be implemented to the DCFO members.

This handing-over of the Distributary Canal Systems to the DCFOs was a major step in the Farmer Organization Development Program. The handing-over procedure was later officially documented under the Irrigation Sector Assistance Agreement between GOSL and USAID which is discussed under Section 3.8. that follows:

### 3.7 USAID DECISION TO END PROJECT ON PACD

#### o USAID's Decision to End Project on Original PACD

USAID decided in September 1989 to terminate the ISMP on the original PACD date of 30 June 1992, in spite of the recommendation made in the Mid-Term Evaluation to extend the Technical Assistance for at least two years. We believe USAID's decision was based on the belief that the Contractor had achieved the TA objectives of upgrading IMD/ID institutional capacities to improve the performance of existing major irrigation systems and, at the field level, to test and demonstrate several new approaches to rehabilitation and management improvements. In addition, effective coordination has been developed between GSL agencies responsible for agricultural extension, research and other support services to help assure that the improvements in water management are translated into increased agricultural production.

### 3.8 USAID DECISION TO IMPLEMENT IRRIGATION SECTOR ASSISTANCE AGREEMENT.

Once the decision was made by USAID to implement the Irrigation Sector agreement, they set-up criteria for implementing an Agreement with GOSL for the turn-over of funds remaining under ISMP at PACD. The terms of this Agreement were stipulated under the criteria established for release of Tranche funds as presented on Table 3.8.1 that follows:

Tranche 1 was completed and funds released in September 1991; Tranche 2 was completed and certified by TA contractor in December 1991 and Tranche 3 was completed and certified by TA Contractor by PACD 30 June 1992.

#### IV POSITIVE AND NEGATIVE FACTORS AFFECTING IMPLEMENTATION

The ISMP Team was subjected to numerous constraints in the implementation of this Project; most were typical of development projects. The major exception, of course, was the civil unrest which caused significant delays in the implementation schedule.

There were also, however, positive factors which promoted achievement of Project objectives. Chief among these was the personal interest and support of the USAID Project Officer and IMD Project Director. Also, the high level of interest exhibited by farmers in working jointly for common benefit and the relatively high level of education of the rural Sri Lankan made the task of organizing and training farmers a bit less difficult. Finally, but just as importantly, Sheladia believes that the expanded utilization of host-country professionals in implementation was a major factor in Project success.

Enumerated below are the major positive and negative factors affecting implementation of ISMP.

##### 4.1 GENERAL

###### Positive Factors

- o Inter-agency Coordination (where it existed)
- o USAID Flexibility in Implementation Approach
- o Eventual, though Late, Introduction of Crop Diversification Component
- o Expansion of Sri Lankan Professionals' Role in TA Team
- o Farmers' Willingness to Participate in Project Implementation
- o Generally High Level of Education/Professional Expertise in Sri Lanka

###### Negative Factors

- o Civil Disorder Punctuated Project for Duration
- o Lack of Consistent/Rational GOSL Policy
- o Farmer/IMD/ID Perception of Relative Deprivation vis a vis Other USAID Projects
- o Inadequate Level of Inter-agency Coordination
- o Lack of National Oversight for Inter-agency Coordination
- o GOSL and Farmers' Capability to Cope with Tight Implementation Schedule
- o Coverage and Timing of Project Pre-Feasibility/Diagnostic Analysis

## 4.2 FARMER ORGANIZATION DEVELOPMENT

### Positive Factors

- o Collection of Membership Fees by DCFOs
- o Establishment of Development Funds by DCFOs
- o Training of Field Canal Representatives in Financial Management
- o DCFO Participation in Preparation of Annual Budgets
- o DCFO Use of Development Funds to Purchase Agro-Inputs in Bulk
- o DCFOs Establishing Bank Accounts and Maintaining Their Own Books
- o Extensive Use of IOs
- o Some DCFOs/SLFOs Preparing Monthly Income and Expenditure Reports
- o Involvement of FOs in Rehabilitation and Maintenance
- o Legal Recognition of DCFOs
- o Rising Input Prices
- o Involvement of DCFOs/SLFOs in the Marketing of Farm Produce
- o Gap Between Achieved and Potential Output

### Negative Factors

- o Collection of O&M Fees is far from Universal in a Given DCFO
- o Financial Management Program Was Late Getting Under way
- o Delayed/Inadequate Technical and Computer Training to FM/MEF Assistants and DCFO Officials
- o Non-availability/Non-accessibility of Computers to FM/MEF Assistants
- o Existence of Disincentives to Organize for Sustainability
- o Abruptness of D-Canal Turn-Over
- o Delay in Creation of Work Committees within the DCFOs/SLFOs

## 4.3 OPERATIONS AND MAINTENANCE

### Positive Factors

- o Preparation of Annual Maintenance Plans
- o Preparation of Improved Water Management Program
- o Farmer Participation in Rehabilitation
- o The O&M Training Program for DCFO Representatives
- o Training of Technical Assistants in O&M
- o Introduction of Cost Effective Type Plans and Structural Improvements
- o GUSL Willingness to Pay Costs in Excess of the (Inadequate) Budget for Essential Rehabilitation

### Negative Factors

- o Availability of Construction Materials
- o Lack of Project Planning Data -- Maps /Extent /DCFU Locations/Hydrological Boundaries
- o Brevity of Construction Period (2 months/year) and LOP (5

- years)
- o Low Priority Given to Operations by ID
- o GOSL Budget for O&M
- o GOSL Budget and Allocation Method for Rehabilitation (fixed Rs./acre)
- o Only Structures in Field Channels Rehabilitated with Project Resources

#### 4.4 MONITORING, EVALUATION AND FEEDBACK (MEF)

##### Positive Factors

- o Appreciation of the Value of MEF by GOSL and USAID
- o MEF Monthly Scheme-Level Reports

##### Negative Factors

- o Unarticulated or Conflicting GOSL/USAID Requirements and Expectations
- o Limited GOSL Experience/Personnel
- o Limited Computerization
- o MEF Monthly DCFO-Level Reports
- o Perceived Benefit of MEF to DCFOs
- o Planning Capability of DCFOs

#### 4.5 TRAINING

##### Positive Factors

- o Training Program for DCFO Representatives in O&M
- o Training Program for Technical Assistants in O&M

##### Negative Factors

- o Absence of Monitoring and Evaluation of Training Programs
- o Lack of Continuous Educational Program Follow-Up

#### 4.6 CROP DIVERSIFICATION

##### Positive Factors

- o Inclusion of Crop Diversification as a Component of the Project
- o Participation of the Department of Agriculture in Implementation
- o Declining Net Returns to Paddy
- o Physical and Environmental Conditions Conducive to Crops Other Than Paddy
- o High Net Income, Better Income Distribution, and Increased Employment Opportunities in OFC
- o OFC Stabilizes Soil Productivity

164

### Negative Factors

- o Lack of Local IMD Counterpart
- o Withdrawal of Grass-Roots Level Extension Workers (KUSN)
- o Crop Risk

### 4.7 PROCUREMENT

#### Positive Factors

- o Quality of Items Procured (Except Computers)
- o Joint needs assessment/remission at inception

#### Negative Factors

- o Timing of Procurement for Project Implementation Needs
- o Quality of Computers Procured for Water Management/MEF
- o USAID and GOSL Procurement Procedures
- o Unavailability of Construction Materials

### 4.8 RESEARCH

#### Positive Factors

- o Study Completed in mid-1992 on Cost Effective Modernization Strategies
- o Study on Hydraulics of Water Management Structures
- o Literature Review on Rehabilitation Projects

#### Negative Factors

- o Research Relevance to Implementation
- o Use of Resources on Poorly Conceived/Executed Studies (e.g., Study on Crop Productivity in Polonnaruwa, O&M Cost Study, etc.)

165

## V LESSONS LEARNED AND CONCLUSIONS

### 5.1 LESSONS LEARNED

#### 5.1.1 Farmer Organization Development

The handing-over interviews of DCFO Officers and members of the Board of Directors proved useful in furthering farmers' understanding of the importance of farmer organizations in increasing their production and income. If this evaluation via Score Card had been introduced earlier in the DCFO's development, the ISMP FO Program would have advanced even more rapidly.

Collection of O&M fees is a sensitive matter. Rather than collecting fees for O&M, per se, ISMP promoted the establishment of DCFO Development Funds which would be used not only for O&M, but as working capital for other income-generating activities. This has been an apparently successful strategy.

Finally, organizing farmers is a difficult task. It takes time, motivation and a set of practical incentives. The farmers have different problems pertaining to water, land and other resources and cannot be treated as monolithic. In working with the farmers, it is helpful to understand them from a humanistic point of view.

The development and sustainability of Farmer Organizations depend on all water-users becoming members of the DCFOs and the DCFOs in turn must serve the needs of their members. It is essential that a constant dialogue be maintained among DCFO Representatives and the DCFO farmers. Finally, all members must pay their fees or be sanctioned in some manner; otherwise the free rider problem will undermine participants' motivation.

#### 5.1.2 Operations and Maintenance Improvements

The participation and involvement of the DCFOs in O&M improvements enhanced their awareness of their responsibilities as beneficiaries of the Irrigation Schemes. It also helped them improve their capabilities in undertaking contract works on irrigation facilities.

Some Sub-Projects take three to four years to complete due to existing local conditions and the length of time in preparing designs and estimates which at times extend up to the close season. Contractors do not maintain the works they have completed earlier so these works deteriorate even before they are turned over and reported as completed.

Various types of structures have been constructed within the ISMP area depending on various factors. Rubble packing of scoured outlets of structures and side slopes of big canals are common sights and are still in place. In other areas retaining walls/toe walls have been constructed instead of rubble packing. There are also toe walls constructed on small field canals which appear to be too bulky and inappropriate for small canals. Rubble packing would

have been better or even well compacted earthfill would have been sufficient.

Improvements to headgates or turnouts for the installation of screw type sliding steel gates come in different sizes and shapes. It was observed that improvements undertaken on these structures in Gal Oya RB, Ridi Bendi Ela, and some schemes in PSS in Polonnaruwa, are of the correct height and size and are more economical to construct than the others. The more economical ones have been highlighted in the Quarterly Report for the quarter ending September 1991.

It was observed that most outlets of newly constructed drop structures along distributary canals are scoured and need protection from further scouring.

Based upon detailed results developed for the twelve DCFOs in the Giritale Scheme the following information regarding the maintenance of the D and F canals to be taken over and maintained by the DCFOs can be stated:

- The average cost Annual Maintenance of the DCFOs in Giritale Scheme was about Rs. 205 per acre.
- Labour requirement of the Maintenance Cost was found to be about 75% or about Rs. 155 per acre.
- Cost of material, equipment, fuel, etc. is only 25% of the Maintenance Cost, or only Rs. 50 per acre.

Based upon the above results it can be concluded that the annual cost needed for the DCFO to maintain their D and F canals is only about Rs. 50 per acre provided the members contribute their labour to the organization to implement the Annual Maintenance Plans.

Operation and maintenance are parallel, but separate activities in the Irrigation Schemes. The funds for these activities are usually given as lump sum appropriations. The Annual Maintenance Cost for the Main System have been prepared for most the Schemes within the ISMP area. An Operation Cost Estimate for the Giritale Main and Distributary System was prepared based on the actual needs for sustained operation including the operation of the Division Computer Center. It is expected that the lump sum appropriation provided by the IMD for O&M of Schemes, would now be easier to allocate based on the these estimates for the individual activities and will redound to a more efficient and effective implementation of the O&M program of the respective systems.

During walk-through surveys for planning rehabilitation works, more care should be made in considering which works are to be given priority especially when funds are limited. Canal structures that are about to collapse but could still be saved and easier and more economically repaired must be given priority over those that have already collapsed.

In the selection of the type of canal protection structures to be adapted, the use of the rubble packing against the bulky and more expensive toe walls must be closely studied, especially in areas where the topography is flat and the danger of canal washout is not imminent.

For the improvement of turnout headgates for the installation of screw type steel gates the smaller structures like the ones constructed in Gal Oya RB, Ridi Bendi Ela and some parts of Parakrama Samudra Schemes could be looked into and adopted in the unfinished Sub-Projects and/or in future rehabilitation projects.

Rubble packing should be used to stabilize the canal side slopes at the outlet of drop structures with outlets already being scoured.

Pipe outlets in field canals must not extend beyond the toe of the canal embankment. If the width of the canal bund is sufficient the pipe outlet should extend only up to the toe of the canal bund.

## 5.2 CONCLUSIONS

### 5.2.1 SUSTAINABILITY

#### Farmer Organization Development

Each of the major components of this Project will require additional outside assistance in order to fulfil the Project Purpose of improving rural incomes through farmer-managed operation and maintenance of irrigation systems on a sustained-renewal basis. While the TA Team succeeded in organizing almost 200 D-Canal Farmer Organizations, each with an average of 10-12 Field Canal Groups, the capabilities and cohesiveness of these organizations varies greatly. Some organizations have been formed very recently while others have been in existence for some time but are plagued with problems; these will likely fail if the ISMP effort ceases on 30 June 1992. Others still, the vast majority, will struggle along trying to develop themselves by relying on their limited experience and resources and the training they have received to date under ISMP. The final percentage of DCFOs who will succeed in sustaining the O&M of their systems and diversifying into agri-business and other income-generating activity is not known. However, it is obvious that further training in Financial Management, Planning, MEF and Business would have a tremendous pay-off given the level of interest and enthusiasm among farmers at this time.

Finally, it must be recognized that, in general, all of the DCFOs are in their infancy, especially with regard to agri-business activity.

#### Operations and Maintenance

The information and data developed under the Annual Maintenance Plans and related documents, if implemented under the Preventative Maintenance Program after ISMP, should, be effective in sustaining the Main Systems provided the maintenance funds determined under

the Annual Maintenance Plans are provided to the ID by the GOSL for each Scheme. So far the funds allocated for maintenance by the GOSL for the four Schemes in the Polonnaruwa Range is only about 40% of that required according to the Annual Maintenance Costs developed for the Main System of these four Schemes. Furthermore, part of that budget allocation for Maintenance was to be used for the D-Canals, so it is even less than 40% of the Main System maintenance required.

Additional funds must be allocated for Main System Maintenance if the Schemes under the ISMP are to be sustained under Preventative Maintenance Program without need for major rehabilitation in the future.

The Annual Maintenance Plans and Costs developed for the Distributary Systems of 5 of the 7 Schemes (92 out of 201 DCFOs) of the Project was a major effort of accomplishment. This information and data developed under the Annual Maintenance Plans if implemented by the DCFOs after the Project should be effective, provided the DCFOs develop the man-power and funds to fully implement the plans for sustaining the systems. To date, these Annual Maintenance Plans have not yet been implemented by the DCFOs, so conclusions as to the effectiveness of the Preventative Maintenance Program at the Distributary Canal Level remains to be seen as of 30 June 1992.

The Action Plan for the implementation of improved water management in all the Schemes within the ISMP area had been developed after discussions and review of past experiences on the subject. The Plan is meant to improve the management of the resources available within the Schemes. The implementation of the activities under the plan is easy but needs dedication and perseverance. Operation and Maintenance is not an attractive field so that unless the personnel involved are properly motivated and compensated, they look down upon it in favour of the other fields of Engineering. The Irrigation Department has technical personnel very capable of undertaking the implementation of the Plan. There are those who like to undertake challenges and this is a very challenging activity.

### 5.2.2 EFFECTIVENESS

The Project achieved significant progress toward attainment of its goals. In some instances, goals were exceeded. The major exceptions are the delayed implementation of the Preventative Maintenance Plans and the overall program in Ampara. The PM program was effective in the sense that detailed plans have been drawn up collaboratively for Preventative Maintenance, but no scheme has yet implemented these plans because of the inadequate time allowed in the Project, given the extremely short construction/maintenance season. PM cannot begin until rehabilitation was completed. The reader is referred to Chapter II of this Report for a detailed review of accomplishments against targets for each Project component.

### 5.2.3 RELEVANCE

In some ways, the development constraints the Project was designed to address are no longer relevant to AID's current development strategies. Foremost of these is the Project's objective of putting in place a mechanism that will allow O&M of selected irrigation systems on a sustained-renewal basis. While AID has apparently retreated from the funding of irrigation projects, several considerations continue to make ISMP strategies relevant in substance. Some of these specific strategies used by ISMP to promote rural income generation, technology transfer, and improved resource use, appear below:

- o women-in-development
- o agro-enterprise development
- o land tenure
- o beneficiary participation
- o soil and water conservation
- o self-financing operations/privatization
- o crop diversification
- o public-private partnerships

### 5.2.4 EFFICIENCY

It must be said that the multi-disciplined, participative approach envisioned in the Project Paper and expanded by the TA Team was indeed efficient. Each component offered reinforcement to the others and the enlarged role for local professionals which was adopted provided both a critical mass and an intimate knowledge of local conditions which was cost-effective. It should also be noted that the costs incurred on this Project were relatively low compared with those of similar ongoing projects in Sri Lanka.

In hindsight, efficiency would have been improved if the following had been incorporated in the Project design:

- o Target groups' awareness of the Project's objectives and plans was not achieved until the latter half of LOP. Had there been a mass media awareness campaign early in the Project, earlier participation of the targeted farmers could have been achieved and progress on Project objectives enhanced.
- o If there were direct contracts in construction with the farmer organizations, supervised by private sector firms, rehabilitation work could have been accelerated--at the same or lower cost.
- o Local and overseas training would have provided greater benefit to the Project had it taken place in the first year or two of the Project, or even in a pre-Project phase.

### 5.2.5 IMPACT

While it is still too early to make many definitive judgements as to positive and negative impacts of ISMP, some notable changes have already occurred. Positive impacts observed include:

- o The acceptance by farmers of participatory management of the irrigation system, including in many cases an awareness and acceptance of the government's inability to cover O&M costs.
- o Farmers have become involved in diversified income-generating and financial management activities.
- o More economical methods of rehabilitation have been introduced and adopted (e.g., use of Dry Rubble Packing vs. Toe Walls)
- o Greater equity in the allocation of water due to training in water management and the installation of water measuring devices at headgates and boundaries of DCFOs.
- o Use of the Field Operations Units established by ISMP by ID, IMD, field personnel and farmers.
- o A high level of enthusiasm exists among Farmer Organizations and Women's Organizations, while expectations appear reasonable.

The only major potential negative impact that can be envisioned at this time is that the DCFOs may falter, making it much more difficult for any future effort to get cooperation.

## VI PROJECT SUSTAINABILITY REQUIREMENTS

### 6.1 PURPOSE AND OBJECTIVES OF FOLLOW-ON ACTIVITY

The Purpose of future Project activity in the ISMP Schemes is to provide greater sustainability while promoting a gradual and planned transition away from external support. Specifically, the follow-on should seek to continue to increase rural incomes through improved yields, diversified production, and improved water management, while institutionalizing farmer self-reliance in the operation and maintenance of the irrigation systems on a sustained-renewal basis.

The objectives of future Project activity will be to:

1. Strengthen Farmer Organizations through training and experience such that they are financially and institutionally capable of sustained existence and organic growth.
2. Strengthen Farmer Organization capabilities in improved operation and maintenance and management of their Distributary Canal Systems.
3. Promote agri-business and other income-generating activities among the Schemes' farmers.
4. Ensure fuller participation of Women in Development and in the benefits of development.

### 6.2 STRATEGIES

A set of strategies to achieve these objectives was developed during the Sheladia Team's Lessons Learned Workshop conducted during the last month of ISMP. These are presented below. Given the extent of current needs, it is proposed that a three-year effort be planned which would provide technical assistance and training on a declining basis.

#### 6.2.1 Strategies for GOSL

- o Decentralize GOSL coordination of field activities, but continue to liaise with a National Project Director.
- o Improve periodic inter-agency scheme-level meetings; provide resources for lunch, travel, honoraria; improve management of meetings (minutes, agenda, guest speakers, etc.).
- o IMD to support Crop Diversification from internal or PL 480 sources.
- o Use the Irrigation Sector Assistance Fund, in part, for the follow-on activities.
- o Appoint IDOs for each major scheme at a frequency of one per 10,000 acres.
- o Make Agricultural Instructors available for Crop Diversification and Paddy Production at a frequency of one per 10,000 acres.

- o Continue the financing of Financial Management/MEF Assistants as long as needed.
- o Assign one full-time ID official (Technical Assistant level) for O&M at each scheme.
- o Provide the O&M funds required for the Preventative Maintenance and System Operations Programs for the Main Systems as developed during ISMP.
- o ID to implement Preventative Maintenance Program for the Main Systems.
- o ID to implement improved Systems Operation Program.
- o ID to complete the DCFO Annual Maintenance Plans for Gal Oya Right Bank and Left Bank Systems.
- o ID to continue to provide technical support to DCFOs in construction management, quality control, maintenance and operations.

**6.2.2 Strategies for All Implementors (GOSL, USAID, Contractors, NGOs/PVOs)**

- o Strengthen legal status of DCFOs.
- o Develop SLFOs as legal entities.
- o Facilitate DCFO access to credit or grants for start-up capital for such outlays as warehouses, weigh scales, mills, trucks, etc.
- o Maximize utilization of Women's Organizations in income-generating activities.
- o Expand Women's Organizations' participation in DCFO activities, as well as planning and decision-making.
- o Encourage DCFO to hire paid employees for technical and management support. Provide FM/MEF training to these DCFO employees.
- o Provide MEF, Management, Business and Leadership Training for DCFO/SLFO leaders.
- o Spread the burden of DCFO activities through the formation of various Work Committees which would develop and implement plans and monitor and evaluate related activities.
- o Use external PVO/NGO resources, such as those of VOCA, ACDI, and Ford Foundation.
- o Use Sri Lankan PVO/NGO resources increasingly, such as those of Janasaviya Trust Fund or Sarvodaya.
- o Facilitate DCFO-financed compensation for Jalapalakas and Field Canal Representatives.

- o Upgrade 10 capabilities and retrain as DCFOs' requirements mature.
- o Continue to provide modest material and financial resources to DCFOs and SLFOs on a declining basis with an aim of establishing them as viable business entities.
- o Focus efforts on priority DCFOs to be selected based on needs and potential impact of interventions. Provide least some continued assistance to all DCFOs to provide an equitable chance at sustainability and provide valuable lessons.
- o Maximize utilization of existing GOSL channels for implementation.
- o Undertake Training Needs Assessment of DCFOs and SLFOs to assist in targeting limited resources.
- o Progressively develop linkages with Governmental Agencies, NGOs/PVOs and private sector entities.
- o Continue, at an intensified level, awareness-raising among DCFOs of the requirements of privatization (e.g., hiring of managers and IOs, financial management, etc.).
- o Expand crop diversification activities.
- o Continue involvement of DCFOs in decision-making concerning rehabilitation, O&M and system operation.
- o Continue DCFO participation in rehabilitation contracts, to be expanded to include Distributary-Level work.
- o Rationalize incentives; do not punish successful DCFOs by cutting of maintenance funds.
- o Reinforce DCFO/SLFO capability to prepare, implement, monitor and evaluate the following:
  - Seasonal Crop Production Plans
  - Annual Maintenance Plans
  - Annual Budgets
  - Crop Marketing Plans
  - Business Management Plans
  - O&M Plans
  - Preventative Maintenance Plans

## VII RECOMMENDATIONS

The ISMP Team has developed a set of recommendations for each component of the Project as well as a set which applies across components. These recommendations were developed to address the issue of sustainability of the social, economic, institutional and physical objectives of ISMP.

Because some of these recommendations are more urgent than others, some are essential and some are more broadly applicable, they have been organized along these dimensions. The starred items are considered not only essential but of high impact.

The majority of these recommendations have applicability beyond the bounds of the ISMP schemes in Sri Lanka; those that do are not followed by "ISMP" or some other delimitation in parentheses. There is also a separate section for recommendations pertaining to the Ampara Range given the less developed status of its schemes.

The designation of some recommendations as implementable in the Medium-Term does not mean to suggest there would be no advantage to their earliest possible implementation, but simply that they can be delayed for a limited time should resources be inadequate at present to undertake the proposed program in its entirety.

It is hoped that this organization of the recommendations will aid persons continuing the work ISMP started as well as designers and implementers of similar projects to set priorities and assess the policy implications of certain strategies for technology transfer and sustainable development.

### 7.1 GENERAL

#### Essential Recommendations to be Implemented Urgently

- 1.\* Improve the awareness among Project participants of the Project's objectives, strategies and approach to implementation.
- 2.\* Complete the outstanding activities programmed for 1992.

#### Highly Desirable Elements for Consideration

1. Conduct annual implementation workshops for each scheme for the purpose of planning and evaluation.
2. Use mass media for strengthening and developing farmer organisations.
3. Develop pilot areas wherein deficiencies are corrected and the program is refined before expansion to other areas. These areas specifically, should be rehabilitated by the ID and DCFO farmers sufficiently trained and practised in diversified crop cultivation, water management, O&M, financial management, etc.

4. DCFOs to make decisions in advance to forego a Yala season for either the undertaking of rehabilitation works or the planning of OFC.

## 7.2 FARMER ORGANIZATION DEVELOPMENT

### Essential Recommendations to be Implemented Urgently

- 1.\* IMD to assign an officer to each of the Districts to coordinate the activities of the Project Managers.
- 2.\* Continue to involve women in agro-processing and other income-generating activities.

### Highly Desirable Elements for Consideration

1. Confer full legal status to DCFOs as well as SLFOs under the Irrigation Ordinance and other applicable laws of Sri Lanka. SLFOs to register under the CAS Act of 1991.
2. Improve procedure in the registration of SLFOs/DCFOS with the Department of Agrarian Services.
3. Consider seriously issuing free titles to settlers.
4. Require title holders to consult the DCFO if they desire to sell or mortgage their land.
5. Promote constant dialogue between DCFO officers and members.
6. DCFOS to prepare, implement monitor and evaluate the Annual Budget and Work-plan.
7. DCFOS to prepare, implement monitor and evaluate Crop production and Marketing plans.
8. SLFOs and DCFOS to prepare, implement monitor and evaluate Business plans. Further the SLFO to begin work on a Development Plan.
9. Improve general membership understanding of rights, responsibilities, benefits, costs and risks associated with service contracts for O&M and rehabilitation work. (ISMP)
10. Institute mechanisms to diversify the sources of /DCFO funds; DCFOS cannot be financed and sustained in the long-run solely based on direct farmer contributions. Rehabilitation contracts, O&M contracts, agro-input purchasing, crop marketing and joint ventures are good examples of potential income-generating activities.
11. Provide start-up capital by facilitating loans or joint ventures or identifying grant sources.

## Essential Recommendations to be Implemented in the Medium Term

1. The Project Manager's Office should evaluate DCFO performance every year using the same set of indicators delineated in the Score-card used in evaluating candidate DCFOs for Management take-over of Distributary Systems. (ISMP)
2. Put in place a mechanism by which DCFOs can impose penalties.
3. Create work committees in the DCFOs to spread the burden of preparing and implementing the various annual plans.
4. Review the lessons learned from previous and other ongoing FO programs.

## Highly Desirable Elements for Consideration

1. SLFOs and DCFOs to consider becoming involved in Joint Venture companies.
2. Institute Field Canal Group Membership agreements following a session orienting farmers to objectives, expected benefits and obligations.
3. Establish offices for each DCFO.

## 7.3 OPERATIONS AND MAINTENANCE IMPROVEMENTS

### Essential Recommendations to be Implemented Urgently

- 1.\* Provide the necessary transport, communication and accommodation facilities to technical staff.
- 2.\* Impose strict quality control standards on rehabilitation work.
- 3.\* Pay for field canal earthwork under Project funds. Users can still pay for this work, but indirectly. DCFOs should be assessed fees based on average costs of the earthwork. The Project, via ID, should then contract out the work. DCFOs could recoup their fees by undertaking these contracts and thus an incentive would be in place to assure completion of this earthwork which has, without fail, constrained every irrigation project in Sri Lanka.
- 4.\* Utilize rainfall effectively thereby maintaining tank water levels.
- 5.\* The Technical Assistant (TA) of the Field Operations Unit and the DCFO Water Master to make joint walk-through verification of water needs. (ISMP)
- 6.\* ID to rehabilitate the D-Canal system prior to the turning over to DCFOs.

7. Continue to conduct walk-through surveys to identify the work to be done with the participation of Farmer Representatives.
8. Define criteria for rehabilitation thoroughly before a project commences. These criteria should guide budgetary commitments.
9. Award contracts only to DCFOs that express a strong interest in the work and only if they are well organised and have received ID training in construction management practices and quality control.
10. Continue the construction of measuring devices at an intensified pace.
11. ID and IMD continue to assist and guide the DCFOs in O&M activities. The Field Operations units should be used as a meeting and discussion place.
12. DCFO to develop its O&M plan at least 30 days before the Kanna meeting and submit it to SLFO, IE and staff for discussion. This plan can, infact, be presented at the Pre-seasonal meeting to be finalised at the Kanna meeting.
13. GOSL to allocate additional funds for the maintenance if the Main System.
14. Maintain a full-time ID officer at each scheme, even after handing over the D-canal operations to DCFOs, for the guidance and supervision purposes.
15. The DA and Head of ROC to analyze the Water Management Evaluation Report weekly and take corrective action as appropriate. (ISMP)
16. Prioritize calibration of all measuring structures remaining to be calibrated. (ISMP)
17. Allocate funds for the immediate repair and ongoing maintenance of the computer unit. (ISMP)
18. IEs to use the set of indicators (Score-cards), developed for evaluation of Water Management Cells, in monitoring their respective schemes.
19. For main canals, branch canals and large D-canal, use current meter calibration at Gauging station. Calibrate the drop structure at the head gate for D-canal. For smaller canals, use the cut-throat flume. (Giritale, Kaudulla)
20. Implement assessment of canal losses. The proper functioning of the Computer Assisted systems operations model (CASOM) requires this information. (Giritale, Kaudulla)

## Essential Recommendations to be Implemented in the Medium Term

- 1.\* Revise the present handing over program for O&M of D-canal systems so that successful DCFOs are rewarded financially, rather than punished with the withdrawal of support--sometimes before rehabilitation works are complete.
2. ID personnel and DCFO representatives to work together in preparing the plan ESI work.
3. Involve DCFOs in O&M service contracts as early as possible.
4. Include the development of adequate planning maps for the irrigation schemes in the earliest stage of project implementation. The maps must be to scale and must delineate field canals.
5. Replace the ID standard inclined drop structure with the ISMP standard vertical drop design for D-canals and F-canals. These are very 2/3 the cost, more effective and virtually maintenance free.
6. Use dry rubble packing for canal bank stabilization. It is very effective and half the cost of retaining walls.

## Highly Desirable Elements for Consideration

1. Do not impose arbitrary or general limits (eg. a given cost per kilometre) on the amount to be spent for the rehabilitation of irrigation facilities; rather costs should be based on agreed criteria as mentioned above. Costs and requirements vary not only by scheme but even along a single D-canal.
2. The Head of ROC to co-ordinate the activities of the CASOM. (ISMP)
3. Use the computers purchased under the ISMP for Water Management more fully and more appropriately. (ISMP)
4. Prepare construction plans one year in advance of construction so that they can be reviewed, modified and contracted in time.

## 7.4 FINANCIAL MANAGEMENT IMPROVEMENT

### Essential Recommendations to be Implemented Urgently

- 1.\* Train and monitor officials of DCFOs and SLFOs so that they prepare monthly income and expenditure accounts and bank reconciliations.
2. Continue IMD/ID monitoring and encouragement of DCFOs and SLFOs to ensure they prepare, implement, monitor and evaluate Annual Budgets.

3. DCFOs and SLFOs to compile and maintain address records of their membership.
4. Update specification registers on an on-going basis.
5. Train the Institutional Organizers, Field Channel Representatives and Financial Management Assistants in Financial Management.

#### Essential Recommendations to be Implemented in the Medium Term

- 1.\* Audit the DCFOs and SLFOs and assist them in the preparation of balance sheets and profit/loss statements.
- 2.\* Ensure collection of membership fees by DCFOs. The fees should be stated in kind--e.g., one bushel paddy per acre per season--so that inflation does not erode collections in real terms. Cash equivalent should be welcome at the going rate for paddy.
- 3.\* Rationalize the fee structure to ensure coverage of O&M costs without free riders while permitting optional participation in other DCFO/SLFO activities on an equitable basis.

#### Highly Desirable Elements for Consideration

1. Computerize available financial, production and marketing data and up-date data annually. (ISMP)
2. Plan for year round construction/rehabilitation work via bypassing work sites, de-watering or using cotter dams. This would require rotating a fraction of the command out of production every year. Alternatively, sufficient allowance must be given in project duration for completion of works during the 2 month off-season. The targeted length of rehabilitation in ISMP should have been programmed over a minimum of 8 years since the latter approach was envisioned.

#### 7.5 MONITORING, EVALUATION AND FEEDBACK

##### Essential Recommendations to be Implemented in the Medium Term

1. Train DCFO and SLFO officials to interpret monitoring information and train the MEF assistants more thoroughly in collecting monitoring data.

#### 7.6 TRAINING

##### Essential Recommendations to be Implemented Urgently

1. Train DCFO leaders at the system level in preparation, implementation, monitoring and evaluation of various Annual plans.
2. Retrain and upgrade the skills of the IOs to keep up with the changing needs of the DCFOs as they develop. (ISMP)

3. Train Jalapalakas and DCFO Presidents to obtain data needed for water management on a daily basis and to make this data available to the SLFO.

#### Essential Recommendations to be Implemented in the Medium Term

- 1.\* Train trainers at the SLFO level in ME&F, applied business management and financial management. (ISMP)

### 7.7 CROP DIVERSIFICATION

#### Essential Recommendations to be Implemented Urgently

- 1.\* Undertake cost-return analysis and evaluation of new crops.
2. Continue farmer training and demonstration programs until the later stages of the "early adoption" phase. Specifically, continue block demonstrations for diversified crops and zero-tillage demonstrations between Yala and Maha. (ISMP)
3. Assist the DCFOs to develop technical and extension services at the grass-roots level. (ISMP)
4. Improve technical support in farm credit, agricultural production and marketing.
5. Increase DOA role in crop diversification--e.g., in awareness training, technical training, extension. (ISMP)
6. Provide incentives to DOA officers.
7. Field Canal Groups to take primary responsibility in selection of fields for new crop trials. DOA and IMD (especially IOs) to assist.
8. ID to solicit the considerable farmer skill, knowledge and experience with respect to both rehabilitation and O&M.

#### Essential Recommendations to be Implemented in the Medium Term

1. Adopt an integrated farming approach to sustain year-round incomes for farmers.

#### Highly Desirable Elements for Consideration

1. Design farm lay-outs for water management suited to OFC production. (ISMP)
2. Increase cropping intensity in the schemes.
3. DOA Extensionists to promote OFC during Maha. (ISMP)

4. Emphasize season-specific concerns in extension efforts.
5. Introduce low-cost technology for culture and processing.
6. Expand field days and field tours.

#### 7.8 PROCUREMENT

##### Essential Recommendations to be Implemented Urgently

1. Conduct computer equipment needs assessment and purchase needed additional equipment. (LSMP)

#### 7.9 RESEARCH

##### Highly Desirable Elements for Consideration

Future research activities should be open to both private and public firms and institutions.

#### 7.10 GAL OYA RIGHT BANK AND LEFT BANK--AMPARA

##### Essential Recommendations to be Implemented Urgently

- 1.\* Train Field Channel Representatives in Operations and Maintenance and Financial Management. (GOLB/GORB)
- 2.\* Train DCFO Representatives in Operations and Maintenance and Financial Management. (GOLB/GORB)
3. Train DCFO Representatives, Field Channel Representatives, Enumerators, IOs, and ME&F Assistants in Monitoring, Evaluation and Feedback. (GOLB/GORB)
4. Train DCFOs in the preparation, implementation, monitoring and evaluation of Annual Budgets, Annual Maintenance Plans, Crop Production Plans, and Business Plans. (GOLB/GORB)
5. Expedite construction of siphon. (GORB)
6. Extend the IOs at least through 1992. (GOLB)

##### Essential Recommendations to be Implemented in the Medium Term

1. Implementing staff to conduct workshops and training for IOs to address their field problems and refine strategies. (GOLB/GORB)
2. Train farmers in agriculture and animal husbandry. Specific subjects to be covered should be based on particular needs (e.g., IPM, zero tillage, cultural practices, seed storage, etc.) (GOLB/GORB)
3. Increase IO coverage gradually to no more than 5 DCFOs in

early 1993 and 10 DCFOs by the end of 1993. (GOLB)

4. Appoint ten Tamil-speaking IOs as soon as conditions allow. (GOLB)
5. Establish a Tamil-speaking segment by appointing a PM and IDO who speak Tamil. (GOLB)
6. Retain present number of IOs for GORB through 1992 and gradually reduce so that each covers 10 DCFOs by early 1994. (GORB)
7. Appoint three Tamil-speaking IOs and one Tamil/Sinhala-speaking IO to Akkaraipattu. (GORD)
8. Appoint one Tamil and Sinhala speaking IDO to Damana. (GORB)

#### Highly Desirable Elements for Consideration

1. Update training modules, manuals and materials on a periodic basis.
2. Train farmers in crop diversification seasonally in advance of the season's beginning. (GOLB/GORB)
3. Use audio-visuals in training.
4. Use resource persons with appropriate skills and qualifications for special training.
5. Implement Volunteer Extension Workshops wherein volunteers are recruited, oriented and trained to disseminate crop diversification techniques and information. DOA extensionists have excessive loads and are inadequate in number. (GOLB/GORB)
6. Construct a Project Office for the Tamil segment. (GOLB)
7. Extend Project activities to the River Division of Senanayake Samudra. (GOLB/GORB)

## ANNEX I

### SHELADIA'S SCOPE OF WORK

#### (a) General/Project Management/Administration

- (1) Assist the GSL Project Manager in the preparation of Life of Project and Annual Work Plans, which describe in detail the project activities to be undertaken, including budget details, construction work programs, detailed training plans, staffing plans, commodity procurement list, etc.
- (2) Prepare Monthly, quarterly and final reports which summarize the specific activities of the TA team members and report on overall progress of the project. The contents of these reports are fully described on Section C.4.
- (3) Assist the MLLD in the collection of data for specified purposes including regularly scheduled evaluation to be conducted by USAID and the GSL.
- (4) Responsible for planning, scheduling, coordinating and administering all technical assistance, and commodity procurement required for successful project implementation. The contractor will be responsible for providing and coordinating the efforts of professionals a coherent technical assistance team consistent with the project objectives. The contractor shall ensure that adequate administrative capability is available throughout the life-of-contract to support the services provided, including all required backstop support from the contractor's U.S. office.
- (5) The team leader will be responsible for assigning the tasks stated in the following sections to the appropriate team members, both expatriate and local; assuring the work is done and is of high quality; and is completed in a timely manner.

#### (b) Farmer Organization Development

- (1) Review literature on farmer organization efforts with special reference to water management and agricultural production activities in Sri Lanka, the ISM Project Farmer Organization Development Plan and baseline information on farmer organization in the project areas. Work with project staff to revise and expand upon recruitment, training, and fielding plans as appropriate. Assist in implementing the program including the establishment of administrative procedures, reporting formats, etc.
- (2) Work with project staff to develop the qualifications and evaluation criteria for selecting Institutional Organizers Ios.

- (3) Assist IMD and the Agrarian Research and Training Institute (ARTI) staff in training IOs, assistant project managers, etc. Develop, refine and field test training materials and modules for various staff levels.
  - (4) Develop a system within IMD to monitor progress in organizing farmers, in conducting farmer training programs and develop a methodology to measure effectiveness of farmer organizations.
  - (5) Develop a methodology for measuring the effectiveness of farmer participation in the Integrated Management of Major Irrigation Schemes (INMAS) program.
  - (6) Prepare, with GSL staff, appropriate information such as brochures, publicity information, scripts for audio-visual presentations, etc. on the Farmer Organization effort which will be used for training and/or public awareness programs.
  - (7) Work with IMD staff, ARTI and others to design and implement surveys, studies and other means to evaluate the progress of the project and its impact on beneficiaries. These studies should be designed utilizing the baseline information from the Diagnostic Analysis Studies, previous ARTI studies and other data which are available and should be coordinated with scheduled mid-term and final project evaluations.
  - (8) Prepare a report which assesses the work carried out during the period of the Farmer Organization Specialist's services in Sri Lanka. The report should review the strengths and weaknesses of the farmer organization effort; provide guidelines for the completion of work scheduled during the life of the project; make recommendations for expanding the program to a national effort, if appropriate; and contain a bibliography of documents prepared by the Specialist during his/her period of service.
- (c) Operations and Maintenance Improvement.
- (1) Assist the Irrigation Department in survey mapping, design and construction of the rehabilitation of the four irrigation systems in the Polonnaruwa District and the Gal Oya Right Bank Systems.
    - Recommended additional mapping requirements, if any, necessary for the rehabilitation.
    - Based on the information collected in the Diagnostic Analysis studies, other Baseline data collection activities, past rehabilitation experience in Sri Lanka and Irrigation Department data, work with ID to design, sizing of canals, suitable locations of appropriate measuring structures, checks, drops, drains, etc.

- Periodically review cost data and forecast costs of the Essential Structural Improvements (ESI) rehabilitation program for the four irrigation systems in the Polonnaruwa District and of the Pragmatic Rehabilitation (PR) program for the Gal Oya Right Bank.
- Recommend appropriate system modifications at the field channel level, including design of measuring structures, farm outlets, extension of canal network to include de facto water users, drainage reuse areas, etc.
- Oversees and develop a reporting format to report progress on designs. Review and recommend for approval all design drawings and documents and all as-built drawings.
- Provide guidance and monitor construction work to assure quality, determine appropriate site changes, and certify completion of project rehabilitation work.
  - Ensure that construction is completed according to approved designs and specifications.
  - Develop in association with the ID, methods of progress monitoring.
  - Develop in association with the ID methods of monitoring for cost control.
  - Develop and work with training staff to present courses for construction supervision and quality control personnel.
  - Assist in identifying sub projects for USAID reimbursement.
  - Recommend and promote efficient utilization of equipment. Assist in planning the equipment utilization, operation and maintenance.
  - Prepare and periodically revise construction progress charts.

(2) Assist with the development and implementation of annual maintenance plans and the preparation of a preventive maintenance program for sustained renewal in the four Polonnaruwa District systems, the Gal Oya Right Bank system, (or other system to be identified) and the Ridi Bendi Ela system.

- Examine present maintenance procedures and identify weaknesses and propose appropriate changes. Recommend staffing levels, schedules, procedures, equipment, etc., necessary for carrying out maintenance surveys and maintenance plans based on priority maintenance needs.
  - Develop and work with training staff to present courses on maintenance.
  - Review existing O&M manuals and prepare an updated maintenance manual specifically for use in the implementation of the preventive maintenance program for each of the schemes.
  - Prepare a report which summarizes the experience of the maintenance program, analyzes the progress under the program, and makes recommendations for implementing the preventive maintenance program in each scheme.
- (3) Assist with the development and implementation of an annual preventive maintenance program in the Gal Ova Left Bank system, or other system to be identified.
- Examine present maintenance procedures and identify weaknesses and propose appropriate changes. Recommend staff levels, schedules of maintenance, procedures, equipment, etc., necessary for carrying out the preventive maintenance program.
  - Develop and implement refinements to the GSL annual budgeting procedures for the Irrigation Department and procedures which utilize supplemental GSL and USAID maintenance funds.
  - Prepare a preventive maintenance manual and work with training staff to train field staff on the implementation of the preventive maintenance program. Refine and update the manual as appropriate.
  - Prepare a report which summarizes the experience of the preventive maintenance program, analyzes the progress under the program and makes recommendations for implementing the preventive maintenance program on a wider basis.
- (4) Assist with and train staff in the development of a water management improvement program in the Gal Ova Right Bank system, (or other system to be identified) the four Polonnaruwa District systems and the Ridi Bendi Ela system. Develop training programs, materials, etc., which enable staff to effectively carry out the program.

- Assist with the development of discharge ratings and calibration for control and measurement structures.
  - Assist with the measurement of losses in the conveyance, distribution and on-farm systems.
  - Conduct on-farm studies to determine water requirements and appropriate irrigation practices for paddy and other crops.
  - Analyze the data, make recommendations for improvements in operating procedures and on-farm practices, and prepare a report which includes the findings and recommendations.
  - Assist in the preparation of seasonal reports on water issues.
- (5) Develop and assist in the implementation of a computerized weekly operations model for the Gal Oya Right Bank, (or other system to be identified), the four Polonnaruwa District systems and the Ridi Bendi Ela System.
- Develop a computer model for scheduling and recording water releases for each system which takes into account soil properties, cropping patterns, system losses, rainfall, etc. Prepare a document which describes and explains the usage of the computer model.
  - Work with training staff to train personnel to utilize the model for operations and prepare seasonal water usage reports.
- (6) Develop and assist in the implementation of a computerized daily operations model for the Gal Oya Left Bank System, (or other system to be identified), which takes into account soil properties, cropping patterns, system losses, rainfall, hydraulic transients, etc.
- Develop and prepare documentation for the model.
  - Work with training staff to train personnel to use the model and prepare seasonal water usage reports.
- (d) Financial Management Improvement
- (1) Review the present O&M fee collection program, including the public awareness of the program, billing, collections, accounting, etc. Make recommendations as to how the program is to be improved.

- (2) Work with IMD financial staff to develop, on a pilot basis an improved financial management program which determines O&M funding needs and priorities, projects O&M funding needs over a five year period, forecasts the available O&M payments, accounts for expenditure of funds and coordinates fee collection with prioritized O&M requirements.
- (3) Develop training materials and work with training personnel to train staff on improved financial procedures.
- (4) Prepare a report which summarizes the experience of the financial management program, analyzes the progress made under the pilot program and makes recommendations for expanding the pilot program.
- (e) Monitoring, Evaluation and Feedback (MEF)
  - (1) Identify performance indicators required to improve the performance of the project irrigation systems including measurements of the internal operations of systems (water usage, distribution efficiency, farmer participation, personnel performance, other inputs, etc.) and ultimate outputs of the system (agricultural production, crop diversification, farmer income, equitable income distribution, environmental stability, etc.).
  - (2) Refine the performance indicators based on management needs at system, district and headquarters levels.
  - (3) After reviewing existing data collection procedures, establish data collection requirements and procedures, reporting formats and sampling methods and frequency of data collection and reporting. Major reports are expected to be prepared seasonally but additional reports may be prepared monthly or annually.
  - (4) Work with IMD, ID and other agency staff to identify appropriate field staff to collect the basic data.
  - (5) Prepare training materials and work with training staff to train field level staff in data collection methods.
  - (6) Develop appropriate computerized methods to analyze data collected under the program. Document the use of the data analysis techniques and train appropriate staff in the utilization of data analysis programs.
  - (7) Work with IMD and other staff to implement the Monitoring evaluation and feedback (MEF) program on a pilot basis in the ISM Project sites. Assist in the preparation of seasonal reports which can be made available shortly after the closes of the season. Assist in the preparation of other MEF Reports whose frequency is to be determined.

- (8) Refine the reports and the data collection effort based on feedback from management and usefulness of the reports. Document the data collection and reporting effort and estimate recurrent costs involved in the MEF effort.
- (9) Prepare an interim report on the progress under the program with the results keyed to the midterm project evaluation. Prepare a final report by the time of the final project evaluation. The final report should summarize progress made on the MEF activity, report any management changes resulting from the program, and recommend any modifications in the program needed to expand it to a national effort.
- (f) Training Capacity Enhancement
- (1) Work with the GSL Project Manager to develop a life of project training plan and annual training plans which specify training activities (incountry and overseas) to be carried out. Assist in the identification and selection of candidates for training. Report on training activities held, maintain lists of trainees who participated, and evaluate training activities.
- (2) In-country Training
- Assist the ID to support improved operations and maintenance procedures developed under the Project through in-service training at Galgamuwa Irrigation Training Institute (GITI) for Irrigation Engineers, Technical Assistants and works supervisors. Review existing materials, develop and refine training materials for the specific skills required in each staff category and work with the training staff of GITI to develop effective in-service training programs.
  - Assist the IMD to develop training materials and conduct in-service training courses for project managers and assistant project managers under the INMAS program. Specific courses dealing with irrigation management, orientation on the MEF program, agricultural production, etc., are to be developed.
  - Work with ARTI to refine training materials for the farmer organization element of the project including pre-service and in-service training for IOs and training for IO supervisors and managers.
  - Work with Sri Lanka Institute of Development Administration (SLIDA) to develop a series of courses in O&M financial management for IMD financial officers at headquarters, district and system levels.

- Work with universities or other organizations to be identified on developing in-service training programs on computer applications in irrigation management and the MEF program to be directed to field and headquarters staff.

(3) Overseas Training:

Identify needs, develop and assist the GSL in implementing overseas training program.

(g) Research

- (1) Participate on a research committee to select proposals for funding under the project.
- (2) Coordinate with other agencies conducting research under the project.

(h) Commodity Procurement

- (1) Assist in preparing lists and specifications for commodities, including maintenance equipment, field and office equipment and vehicles estimated at \$ 3.1 million to be purchased under the project.
- (2) Carry out all off-shore procurement actions under the project in accordance with AID procurement regulations.

These include:

- Prepare Invitation for Bids and Requests for Proposals.
- Evaluate bids and recommend to the GSL, and with GSL approval, make awards.
- Issue contracts or purchase orders.
- Expedite suppliers'/vendors' performance.
- Inspect and consolidate commodity shipments in the U.S.
- Handle and forward procurement/shipping documents.
- Arrange freight forwarding, export packing and ocean/air transport.
- Arrange insurance and process insurance claims.
- Provide reports to AID and the GSL indicating the status of each procurement action.
- Handle management and communication responsibilities required in implementing the procurements.

- Arrange for the payment for commodities purchased under the project.
- Arrange for suppliers to furnish appropriate installation and familiarization support for equipment purchased.
- Pursue economies in the procurement process that may be obtained through improving specifications, soliciting from sources involving the least mark-ups, obtaining project freight rates and utilizing other sound, prudent purchasing practices.
- Facilitate proper and timely clearance through customs.
- Assist in inspection of commodities upon in-country arrival.
- Ensure proper markings, tagging or other identification of commodities as required.
- Ensure entry into the inventory of the Irrigation Department and other agencies.
- Direct proper handling and transit of commodities from point of entry to point of storage/utilization.
- Plan and monitor proper utilization of commodities over the contract period.

C.4. Reports:

In addition to reports specified in sections C. 3. above, the Contractor shall prepare the following reports:

- (a) Monthly Reports: Submit a monthly report covering Major activities, decisions and events, current or foreseen problem areas together with recommendations for their solution. In addition monthly reports will include data on personnel arrivals and departures, local travel, and copies of individual TA team members, reports on work performed during the month and work planned for the following month, staffing levels and other personnel data as appropriate. The report is due on the tenth working day of the following month.
- (b) Annual and Life of Project Work Plans; Assist the GSL Project Manager prepare in both narrative and diagrammatic form a life-of-project (LOP) work plan and detailed annual work plans. These plans shall describe all project activities and shall clearly set out, chronologically, the strategy to be employed in meeting project objectives.

Both the LOP and the annual work plans shall specify the timing, implementation arrangements, responsibilities, and resources required for all activities planned under the project. Each project activity shall be assigned a starting and completion date. A bar chart which plots project activity against time shall be included. The LOP and annual workplans shall identify personnel requirements required to successfully complete each activity. The LOP and annual workplans shall also include budgetary requirements, both from GSL and AID funds. The training plan shall specify information on planned overseas and incountry training course, title of trainers, and purpose of training program. The annual work plans are required and due by November 30, each year and must be approved by AID for each year's activities.

(c) Quarterly Reports: Submit detailed quarterly reports which shall include a report on progress of the project achieved versus progress scheduled on each component of the project and reports on the financial status of the project. The report will include necessary charts and graphs to report actual versus scheduled progress in meeting the project's outputs according to the life of project workplan and any revisions. The report will specifically include data on

- Training, fielding and work of IOs
- Establishing farmer organizations
- Design of rehabilitation work at each site
- Construction work at each site
- Utilization of equipment
- Progress on operation, maintenance and water management programs
- Progress in the financial management program
- Progress in the MEF program
- Training activities held and lists of participants
- Research planned, underway and completed
- Commodity procurement status and commodities on site.

The report is due on the 20th working day after the end of the quarter reported.

- (d) Final Report: Submit a final report which provides an overview of the work performed and resultant findings. The report should highlight major actions or decisions made during the life of the project, results of those actions or perceived reasons for their success or failure. The final report shall serve as a resource document to enhance further development of the management of the project irrigation sites and further irrigation management projects in Sri Lanka.

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## ANNEX II

## LIST OF REPORTS PREPARED BY SHELADIA UNDER ISMP

The list of reports produced by the Consultant during the LOP on the ISMP is presented by each Project Component:

FARMER ORGANIZATION DEVELOPMENT

<u>No.</u>	<u>Name of Report</u>	<u>Person Responsible</u>	<u>Date</u>
1	End of Tour Report	John Wilkins-Wells	30 Mar 89
2	End of Tour Report	P. Ganewatte	March 1991
3	End of Tour Report	N.K.Adikaramge	30 June 92
4	End of Tour Report	R. Kandiah	30 June 92
5	End of Tour Report	H.B. Bautista	30 June 92
6	Literature Review on FO Development	J.Wilkins-Wells	30 March89
7	Guiding Principals on FO	P. Ganewatte	March 1991
8	Innovations FO in S/L	P. Ganewatte	March 1991
9	Assessment Report on FO Development	H.B.Bautista N.K. Adikaramge	30 Jun 92

OPERATION AND MAINTENANCE IMPROVEMENT

<u>No.</u>	<u>Name of Report</u>	<u>Person Responsible</u>	<u>Date</u>
1	End of Tour Report	D.S.A. Kulasekera	12 Mar 91
2	End of Tour Report	S. Balasingam	31 Jan.92
3	End of Tour Report	C.F. Leonhardt	30 June 92
4	End of Tour Report	T.A. Cerdan	30 June 92
5	End of Tour Report	D. Weerakoon	30 June 92
6	End of Tour Report	S.B.Seneviratna	30 June 92
7	End of Tour Report	K. Vallipuram	30 June 92
8	End of Tour Report	W. Amarakoon	30 June 92
9	Update ID Maint. Manual	Leonhardt/Balasingam/ D. Weerakoon	30 June 92
10	Report on ISMP Maint. Progress	Leonhardt/Cerdan/ K. Vallipuram	30 June 92

OPERATION AND MAINTENANCE IMPROVEMENT (Contd..)

<u>No.</u>	<u>Name of Report</u>	<u>Person Responsible</u>	<u>Date</u>
11	Report on Presentative Maint Program GO LB	Leonhardt/Cerdan	30 June 92
12	Water Magt. Computer Model Users Manual	Garry P. Merkley	May 1990
13	Ridi Bendi Ela System O&M & FO Status Report	Leonhardt/Kulasekera P. Ganewatte	15 Oct. 88
14	Annual Maint. Plan - Giritale Main System	C.F. Leonhardt	21 Aug 91
15	Annual Maint Plan - Giritale DCO Puranagama	C.F. Leonhardt	8 July 91
16	Annual Maint Plan - Giritale DCO Agbo	D. Weerakoon	27 Sept 91
17	Giritale DCO - Mahasen	D. Weerakoon	25 Feb. 92
18	Giritale DCO Jayanthipura	D. Weerakoon	20 Feb. 92
19	Giritale DCO - Kauduluwewa	D. Weerakoon	25 Feb. 92
20	Giritale DCO-Unagalavehera	D. Weerakoon	27 Sept 91
21	Giritale DCO-Chandanapokuna	D. Weerakoon	10 Sept 91
22	Giritale DCO-Puranamuslim	D. Weerakoon	25 Mar. 92
23	Giritale DCO - Perakum	D. Weerakoon	10 Sept 92
24	Giritale DCO - Bendiwewa	D. Weerakoon	25 Mar. 92
25	Giritale DCO - Nagapokuna	D. Weerakoon	6 Feb. 92
26	Giritale DCO - Hatalisata	D. Weerakoon	6 Feb. 92
27	Economic Cost Effective Analysis	S. Schick	31 July 89

FINANCIAL MANAGEMENT IMPROVEMENT

<u>No.</u>	<u>Name of Report</u>	<u>Person Responsible</u>	<u>Date</u>
1	End of Tour Report	S. Schick	31 Jan 89
2	End of Tour Report	P. Periyasamy	Oct 1990
3	End of Tour Report	N.K. Adikaramge	30 Jun 92
4	FM.Documentation Report	S. Schick	31 Jan 92

1996

## MONITORING EVALUATION AND FEEDBACK

<u>No.</u>	<u>Name of Report</u>	<u>Person Responsible</u>	<u>Date</u>
1	End of Tour Report	S. Schick	31 July 89
2	End of Tour Report	K. Smith	17 May 91
3	End of Tour Report	P. Periyasamy	Jan. 1991
4	End of Tour Report	K. Smith	Feb. 1992
5	MEF Demonstration Report	S. Schick	31 July 89
6	Seasonal MEF Report Maha 1989/90 RBE Scheme	P. Periyasamy	June 1991
7	Managing the Development Small Farmer Water Users in Sri Lanka a follow-up Evaluation of MEF System	K. Smith	Feb 1992
8	Monitoring & Evaluating Irr. Schemes Performance in Sri Lanka a Proposed System for ISMP/INMAS	K. Smith	Feb 1991
9	MEF Report on Findings and Recommendations	K. Smith	Feb 1991
10	Manual for Analysis of Survey Data for MEF	K. Smith	Mar 1991
11	Final Report on MEF - Final Eval. Report	K. Smith	Feb 1992

## TRAINING CAPACITY ENHANCEMENT

<u>No.</u>	<u>Name of Report</u>	<u>Person Responsible</u>	<u>Date</u>
1	End of Tour Report	H. Robert	Jan 1989
2	End of Tour Report	J. McCallum/Premaratna	13 Apr 91
3	In-Service Training	J. McCallum/Premaratna	Oct. 1990 - Apr. 1991
	o Technical Assistants		
	o - Module 1-D-canal		
	o - Module 2-Main System		
	o - Module 3-Implement Maint. Plans		
	o Institutional Organizers/Course Report No. 1		
	o MEF/FM Assistants Course Report No. 2		
	o T.A. Module 1 Course Report No. 3		
	o T.A. Module 2 Course Report No. 4		
	o W.S. Module 1 Course Report No. 6		
	o Field Canal Representatives Course Report No. 7		
	o Training TAs Training Teams Course Report No. 8		
	o WS Module 2 Course Report No. 9		
	o WS Module 1 Work Organization		
	o WS Module 2 Quality Control		

TRAINING CAPACITY ENHANCEMENT (continued)

<u>No.</u>	<u>Name of Report</u>	<u>Person Responsible</u>	<u>Date</u>
4	Institutional Org. - Photo Report	J. McCallum/Premaratna	
5	Trainer Manual for DC Management	J. McCallum/Premaratna	
6	10s Community Report	J. McCallum	
7	Institutional Org. In-Service Training Booklet	J. McCallum	
8	Final ISMP Training Report	Leonhardt/Amarakoon	30 June 92

CROP DIVERSIFICATION

<u>No.</u>	<u>Name of Report</u>	<u>Person Responsible</u>	<u>Date</u>
1	End of Tour Report	S. Samarakoon	30 Jun 92
2	Interdisciplinary Approach to Crop Diversification in Polonnaruwa District	S. Samarakoon	30 May 89
3	Other Food Crop Production Polonnaruwa Schemes	S. Samarakoon	July 1991

COMMODITY PROCUREMENT

<u>No.</u>	<u>Name of Report</u>	<u>Person Responsible</u>	<u>Date</u>
1	Final Procurement Status Report	Leonhardt/Amarakoon	30 June 92

RESEARCH (Reports Produced from IIMI under ISMP)

<u>No.</u>	<u>Name of Report</u>	<u>Person Responsible</u>	<u>Date</u>
1	Study of Participatory Management Program in Nagadeepa, Mahawewa and Pimburettewa	ADRC	Dec 1990
2	Institutional Building under ISMP	TEAMS	Oct 1990
3	Study of Water Delivery System	Lanka Hydraulics Inst. ltd.	Sept 1990
4	Non-Govt. Org. as Social Change Agents - A case study from Sri Lanka	ADRC	Dec 1990
5	Manual on Flow Measurement of Drop Structures	Lanka Hydraulics Inst. Ltd	15 Jan 91
6	Study on Management and Cost of O&M of Irrigation Systems under ID in S/L.	TEAMS	June 1991
7	Rehabilitation Systems - Literature Review	Dr. T. Abesekera	Aug 1991

RESEARCH (Reports Produced from IIMI under ISMP, continued)

<u>No.</u>	<u>Name of Report</u>	<u>Person Responsible</u>	<u>Date</u>
8	Maximizing Profitability of Irrg. Agriculture in Polonnaruwa Schemes	AICS	June 1991
9	Turnover of O&M of Distributaries to F.Os in Polonnaruwa District	TEAMS	March 1992
10	Cost Effective Strategies for Irrg. Modernization for the 1990's	ECL/ADRC	June 1992

GENERAL AND SPECIAL PROJECT REPORTS

<u>No.</u>	<u>Name of Report</u>	<u>Person Responsible</u>	<u>Date</u>
	Monthly Activity Report		
1	June and July 1987	H.E. Haley & SAI staff	10 Aug 87
2	August 1987	,,	10 Sep 87
3	Sept 1987	,,	10 Oct 87
4	Oct 1987	,,	10 Nov 87
5	Nov 1987	,,	10 Dec 87
6	Dec 1987	,,	10 Jan 88
7	Jan 1988	,,	10 Feb 88
8	Feb 1988	,,	10 Mar 88
9	Mar 1988	,,	10 Apr 88
10	Apr 1988	,,	10 May 88

No Reports from May 88 to Nov 1989

11	Dec 1989	W.J.Leatham & SAI Staff	10 Jan 90
12-24	Jan-Dec 1990(12 Nos)	W.J.Leatham & SAI Staff	10 Fol.mt
25-37	Jan-Dec1991(12 Nos)	Leonhardt & SAI Staff	10 Fol.mt
38-42	Jan-May 1992 (5 Nos)	Leonhardt & SAI Staff	10 Fol.mt
43	June 1992	Leonhardt & SAI Staff	30 Jun 92

GENERAL AND SPECIAL PROJECT REPORTS (Contd..)

<u>No</u>	<u>Quarterly Reports</u>	<u>Person Responsible</u>	<u>Date</u>
1	Jun - Sept 87	L.E. Haley & SAI Staff	20 Oct 87
2	Oct - Dec 87	,,	20 Jan 88
3	Jan - Mar 88	,,	20 Apr 88
4	Apr - Jun 88	,,	20 Jul 88
5	Jul - Sept 88	,,	20 Oct 88
6	Oct - Dec 88	L.E. Haley & SAI Staff	20 Jan 89
7	Jan - Mar 89	L.E. Haley & SAI Staff	20 Apr 89
8	Apr - Jun 89	L.E. Haley & SAI Staff	20 Jul 89
9	Juy - Sept 89	W.J.Leatham & SAI Staff	20 Oct 89
10	Oct - Dec. 89	,,	20 Jan 90
11	Jan - Mar 90	,,	20 Apr 90
12	Apr - Jun 90	,,	20 Jul 90
13	Jul - Sept 90	W.J.Leatham & SAI Staff	20 Oct 90
14	Oct - Dec 90	Leonhardt & SAI Staff	20 Jan 91
15	Jan - Mar 90	,,	20 Apr 91
16	Apr - Jun 90	,,	19 Jul 91
17	Juy - Sept 90	,,	20 Oct 91
18	Oct - Dec 90	,,	24 Jan 92
19	Jan - Mar 92	,,	20 Apr 92
20	Apr - Jun 92	Leonhardt & SAI Staff	30 Jun 92

ANNUAL REPORTS

<u>No.</u>	<u>Name of Report</u>	<u>Person Responsible</u>	<u>Date</u>
1	LIFE-OF-PROJECT WORK PLAN 1987 -1992	L.E. Haley & SAI Staff	Feb. 1988
2	1988 ANNUAL WORK PLAN	L.E. Haley & SAI Staff	Dec. 1987
3	1989 ANNUAL WORK PLAN	L.E. Haley & SAI Staff	Dec. 1988
4	1990 ANNUAL WORK PLAN	W.J.Leatham & SAI Staff	Dec. 1989
5	1991 ANNUAL WORK PLAN	Leonhardt & SAI Staff	Jan. 1991
6	1992 ANNUAL WORK PLAN	Leonhardt & SAI Staff	Dec. 1991

### ANNEX III

#### LIST OF MAPS, DRAWINGS EXHIBITS PREPARED BY SHELADIA UNDER ISMP

During the LOP Sheladia Associates prepared many Maps, Drawings, Charts, Graphs and Exhibits. A List of these are presented below. and classified as General Exhibits common to all Schemes or by Exhibits specific to a Scheme. All of these Exhibits, Drawings, Maps, etc., will be turned over to the DDI Polonnaruwa Range prior to 30 June 1992.

#### A. GENERAL EXHIBITS COMMON TO ALL SCHEMES

IRRIGATION SYSTEM LAY OUT PLAN -  
PARAKRAMA SAMUDRA, MINNERIYA, GIRITALE. KAUDULLA SCHEMES

PARAKRAMA SAMUDRA & GIRITALE IRRIGATION SCHEMES  
YALA SEASON 1985

MINNERIYA & KAUDULLA IRRIGATION SCHEMES  
YALA SEASON 1986

#### 1988 WORK PLAN FLOW DIAGRAM

- 4.0 MONITORING EVALUATION & FEEDBACK TASK
- 0.0 PROJECT COORDINATION FLOW DIAGRAM
- 3.0 FINANCIAL MANAGEMENT TASK
- 5.0 TRAINING CAPACITY ENHANCEMENT

1987 - 88 FARMER ORGANIZATION - FLOW DIAGRAM

1988 ISMP MANAGEMENT PLAN

1989 O & M WORK PLAN

1987 - 88 O & M WORK PLAN (REVISED 1 SEPT. 1988)

SCHEMATIC OF WATER DISTRIBUTION - POLONNARUWA RANGE

SAMPLE STAFF GAGE DESIGN

ISMP LOCATION OF PROJECT SCHEMES

ISMP LOCATION MAP OF PROJECT SCHEMES

**A. GENERAL TYPE PLAN - COMMON TO ALL SCHEMES)**

**TYPE PLAN D-CANAL DROP STRUCTURE - POLONNARUWA RANGE**  
**UNCONTROLLED WEIR TYPE REGULATOR STANDARD PLAN - POLONNARUWA PLAN**  
**TYPE PLAN OF STEEL LIFTIN GATE - POLONNARUWA RANGE**  
**TYPE PLAN D - CANAL DROP STRUCTURE - AMPARA RANGE**  
**TYPE PLAN F - CANAL DROP STRUCTURE - POLONNARUWA RANGE**  
**EARTH CANAL EMBANKMENT - TYPICAL DOUBLE DOUBLE BANK MAIN OR BRANCH CANALS**  
**EARTH CANAL EMBANKMENT - TYPICAL SINGLE BANK MAIN OR BRANCH CANALS**  
**DRY RUBBLE PACKING - TYPICAL DESIGN SECTION**  
**ISMP DESIGNED DROP STRUCTURE STANDARD PLAN 0-3 CFS**  
**ISMP DESIGNED DROP STRUCTURE STANDARD PLAN 4-35 CFS**  
**ISMP DESIGNED UNCONTROLLED WIER REGULATOR STANDARD PLAN**  
**RETAINING WALL TYPICAL DESIGN SECTION**  
**RETAINING WALL TYPICAL DESIGN DIMENSIONS**  
**STANDARD 1.D DROP STRUCTURE**  
- TYPE I (0 TO 3 CFS)  
- TYPE II (4 TO 25 CFS)  
**DRY RUBBLE PACKING TYPICAL DESIGN SECTION**  
**STANDARD I.D REGULATOR PLAN & SECTIONS**  
**TYPE FARM TURNOUT**

**A. GENERAL EXHIBITS COMMON TO ALL SCHEMES (CONT)**

**ORGANIZATION CHART - POLONNARUWA RANGE**  
**ORGANIZATION CHART - AMPARA RANGE**  
**SYSTEMS OPERATION WATER MANAGEMENT CELL ORGANIZATION CHART**  
**SYSTEMS OPERATION WATER MANAGEMENT CELL FUNCTIONAL CHART**  
**POLONNARUWA RANGE**  
**SYSTEMS OPERATION WATER MANAGEMENT CELL FUNCTIONAL CHART**  
**KURUNEGALA RANGE**  
**ISMP - IRRIGATION OPERATION IMPROVEMENT - (2 SHEETS)**  
**ISMP - PREVENTATIVE MAINTENANCE PROGRAM SCHEMATIC DIAGRAM1**  
**ISMP - GENERAL ORGANIZATION CHART**

**WEEKLY OPERATION OF A CANAL OR A SYSTEM**  
**EXISTING CROPPING CALENDER (PAGE 1 OF 2)**  
**RECOMMENDED CROPPING CALENDER (PAGE 2 OF 2)**  
**PROPOSED SYSTEM MODEL**  
**1989 MONITORING, EVALUATION & FEEDBACK WORK PLAN**  
**1989 FINANCIAL MANAGEMENT WORK PLAN**  
**WORK PLAN 1990 - DEMONSTRATION TO MINIMIZE - RED**  
**CULTIVATION & INCREASE CROPPING INTENSITY**  
**ACTIVITY FLOW CHART - CROP DIVERSIFICATION PROGRAM WORK**  
**PLAN - 1990**  
**ISMP TWO YEAR TIME EXTENSION PRELIMINARY CONSTRUCTION**  
**SCHEDULE D & F CANALS ONLY**

**46 NOS OVERHEAD PROJECTOR EXHIBITS ON ISMP ACTIVITIES**

**A. GENERAL GRAPHS COMMON TO ALL SCHEMES (CONT)**

**MANNING TABLE - FIELD & HOME OFFICE STAFF**

**ISMP - LIFE-OF-PROJECT PROGRESS CHART AS OF QUARTER ENDING 31 MARCH 1992**

**LIFE-OF PROJECT PROGRESS CHART AS OF QUARTER ENDING 30 SEPTEMBER 1989**

**ISMP LOP CONSTRUCTION PROGRESS CHART AS OF QUARTER ENDING 31 MARCH 1992**

**REHABILITATION WORK PROGRAM 1987-1992 SCHEDULED AND ACTUAL PROGRESS - POLONNARUWA RANGE**

**PRAGMATIC REHABILITATION WORKS GAL OYA RBMC 1989 TO 1992 - PLANNED PROGRAM & ACTUAL PROGRESS**

**MANNING TABLE - FIELD & HOME OFFICE STAFF (PHOTO COPY)**

**B. GIRITALE SCHEME EXHIBITS**

**IRRIGATION SYSTEM LAY OUT PLAN WITH LOCATIONS OF PCO AREAS**

**MAINTENANCE DIAGRAMS**

- MAIN SYSTEM
- PURANGAMA DCO
- AGBOPURA DCO
- PARAKUM DCO
- KADAWALAWEWA DCO
- BENDIWEWA DCO
- JAYANTHIPURA DCO
- MAHASSEN DCO
- PURANA MUSLIM DCO
- NAGAPOKUNA DCO
- UNAGALAWEHERA DCO
- CHADANA POKUNA DCO
- HATALISATA DCO

**SCHEMATIC WATER DISTRIBUTION DIAGRAM**

- RBMC SYSTEM "B" & CHANDANA POKUNA SYSTEM
- RBMC SYSTEM "A" & KADAWALA WEWA SYSTEMS "A" & "B"
- RBMC SYSTEM - PARAKUM DCO
- RBMC SYSTEM - BENDIWEWA DCO
- LBMC SYSTEM - PURANAGAMA DCO
- RBMC SYSTEM - PURANA MUSLIM DCO
- RBMC SYSTEM - UNAGALAWEHERA DCO
- RBMC SYSTEM - AGBO PURA DCO
- LBMC SYSTEM - CHANDANA POKUNA DCO
- RBMC SYSTEM - NAGAPOKUNA DCO
- LBMC SYSTEM - HATALISATA DCO
- RBMC SYSTEM - JAYANTHIPURA DCO
- RBMC SYSTEM - MAHASSEN DCO
- RBMC SYSTEM - KADAAAWALAWEWA DCO
- LBMC SYSTEM
- CONTROL 4 ISSUE DIAGRAM - GIRITALE SCHEME - 2 NOS

**ANNUAL MAINTENANCE PLAN**

- GIRITALE SCHEME - INLET CANAL, HEADWORKS & MAIN/BRANCH CANALS (MAIN SYSTEM)
  
- FURANA MUSLIM DCO
- UNAGALAWEHERA DCO
- HATALISATA DCO
- JAYANTHIPURA DCO
- AGBOPURA DCO
- CHANDANA POKUNA DCO
- MAHASEN DCO
- PURANAGAMA DCO
- NAGAPOKUNA DCO
- KADAWALA WEWA DCO
- PARAKUM DCO
- BENDIWEWA DCO

**IRRIGATION SYSTEM LAYOUT PLAN WITH LOCATIONS OF DCO AREAS**  
**WATER MANAGEMENT & SYSTEMS OPERATIONS SCHEMATIC**  
**MODEL FOR LAYOUT PLAN ISSUE TREE (SINHALA)**  
**SYSTEMS OPERATION WATER MANAGEMENT CELL - ORGANIZATION**  
**SYSTEM OPERATION & MAINTENANCE ORGANIZATION CHART**  
**WATER MANAGEMENT OPERATIONS CHART**

**C. PARAKRAMA SAMUDRA SCHEME EXHIBITS**

- IRRIGATION SYSTEM LAYOUT PLAN
- IRRIGATION SYSTEM LAYOUT PLAN WITH LOCATIONS OF DCO AREAS
- CONTROL & ISSUE DIAGRAM - PSS D-1 CANAL SYSTEM
- CONTROL & ISSUE DIAGRAM - PSS D-2 & D-3 CANAL SYSTEMS
- WATER MANAGEMENT & SYSTEMS OPERATIONS SCHEMATIC
- SCHEMATIC WATER DISTRIBUTION
  
- D-1 MAIN CANAL & D-1 EAST CANAL SYSTEMS (SHEET 1 OF 5)
- D-1 NORTH CANAL (SHEET 2 OF 5)
- LB-2 OFF RB 21 (SHEET 3 OF 5)
- D-2 CANAL, RB-6 OFF D-2 CANAL (SHEET 4 OF 5)
- LB-3 OFF D-1 EAST CANAL (SHEET 5 OF 5)
  
- ANNUAL MAINTENANCE PLAN
- SYSTEMS OPERATIONS WATER MANAGEMENT CELL - ORGANIZATION CHART
- WATER MANAGEMENT OPERATIONS CHART

**D. MINNERIYA SCHEME EXHIBITS**

**IRRIGATION SYSTEM LAY OUT PLAN WITH LOCATIONS OF DCO AREAS**

- IRRIGATION SYSTEM LAY OUT PLAN
- WATER MANAGEMENT & SYSTEMS OPERATIONS SCHEMATIC
- CONTROL & ISSUE DIAGRAM - GALAMUNA SYSTEM
- CONTROL & ISSUE DIAGRAM - MINNERIYA YODA ELA & RAJA ELA SYSTEMS
  
- SCHEMATIC WATER DISTRIBUTION DIAGRAM
  - MINNERIYA YODA ELA SYSTEM ( SHEET 1 OF 5)
  - D-21 & D-22 CANALS OFF MYE (SHEET 2 OF 5)
  - D-28 & D-31 & D-37 OFF MYE (SHEET 3 OF 5)
  - GALAMUNA MAIN CANAL & D-1, D-4 & D-B CANALS (SHEET 4 OF 5)
  - MINNERIYA RAJA ELA SYSTEM (SHEET 5 OF 5)
  
- SYSTEMS OPERATION WATER MANAGEMENT CELL ORGANIZATION CHART
- WATER MANAGEMENT OPERATIONS CHART

**E. KAUDULLA SCHEME EXHIBITS**

- o IRRIGATION SYSTEM LAYOUT PLAN WITH LOCATIONS OF DCO AREAS
- o IRRIGATION SYSTEM LAYOUT PLAN
- o WATER MANAGEMENT & SYSTEMS OPERATIONS SCHEMATIC
- o SCHEMATIC WATER DISTRIBUTION DIAGRAM
  
- HLMC SYSTEM & BRANCH CANAL NO. 1 SYSTEM (SHEET 1 OF 5)
- SUPPLY CANAL TO AMBAGASWEWA & LBDC & RBDC FROM AMBAGASWEWA SYSTEMS (SHEET 2 OF 5)
- BRANCH CANAL NO. 1A & LB-D1 OFF BRANCH canal no. 1 (sheet 3 of 5)
- LLMC SYSTEM OF BRANCH CANAL NO. 1 & D-3 CANAL (SHEET 4 OF 5)
- D-1 SYSTEM & RB-1 CANAL OFF LLMC (SHEET 5 OF 5)
  
- o CONTROL & ISSUE DIAGRAM - KAUDULLA LOW LEVEL SYSTEM
- o CONTROL & ISSUE DIAGRAM -KAUDULLA HIGH LEVEL SYSTEM
- o SCHEME PLAN (PHOTOCOPY)
  
- SYSTEMS OPERATION WATER MANAGEMENT CELL - ORGANIZATION CHART
- WATER MANAGEMENT OPERATIONS CHART

**F ATTARAGALLEWA SCHEME EXHIBITS**

- o ISSUE TREE

**G. RIDI BENDI ELA SCHEME EXHIBITS**

- IRRIGATION SYSTEM LAYOUT PLAN WITH LOCATIONS OF DCO AREAS
- SCHEMATIC WATER DISTRIBUTION DIAGRAM - LB MAIN CANAL & CENTRE CANAL
- CONTROL & ISSUE DIAGRAM
- ANNUAL MAINTENANCE PLAN
  
- WATER MANAGEMENT OPERATIONS
- SYSTEMS OPERATION WATER MANAGEMENT CELL - ORGANIZATION CHART

**H. GAL OYA LB AND RB SYSTEMS EXHIBITS**

- IRRIGATION SYSTEM LAYOUT PLAN WITH LOCATIONS OF DCO AREAS
- ISSUE TREE FOR LB SYSTEM (PART I)
- ISSUE TREE FOR LB STSREM (PART II)
  
- WATER MANAGEMENT OPERATIONS
- SYSTEM OPERATION WATER MANAGEMENT CELL - ORGANIZATION CHART
- SYSTEM OPERATION WATER MANAGEMENT CELL - ORGANIZATION CHART LB
  
- IRRIGATION SYSTEM LAYOUT PLAN WITH LOCATIONS OF DCO AREAS
- CONTROL & ISSUE DIAGRAM
- GAL OYA LB & RB SYSTEMS LOCATION OF DCO'S

210

## ANNEX IV

### LIFE OF PROJECT PROGRESS SCHEDULE

The monitoring of progress of work over LOP was initiated by the Consultant in the Quarterly Report No. 9 for the period ending 30 September 1989. From that period to 30 June 1992 (PACD) the Consultant has monitored the progress of the actual work under each component using the LOP Planned Implementation Schedule.

Exhibit IV-1 presents the LOP Progress Schedule as of PACD on 30 June 1992. Based upon that schedule approximately 79% of the overall planned project works were completed during the LOP. With the exception of the rehabilitation work, which was only about 33% complete, project works, including FO Development, Improvement to Systems Operation and Maintenance; FM Improvement; MEF; Training; Research; and Procurement were either completed or close to being completed (90 - 100%). Therefore, the overall 20% shortfall of project accomplishments is due almost entirely as a result of the lack of progress of the rehabilitation program in Polonnaruwa and Ampara Districts. Exhibit IV-2 shows the progress of rehabilitation over the LOP and Exhibits IV-3 and IV-4 shows the progress of rehabilitation over the LOP compared to the planned program for Polonnaruwa and Ampara Ranges respectively.

At PACD (30 June 1992) the estimated level of completion of the Irrigation System Management Project stands at 79% as against 100% as scheduled or a shortfall in targeted achievement of 21%.

The estimated percent complete by component and sub-components at PACD is presented on Table IV-1 on the following page:

TABLE IV-1

FINAL PERCENT COMPLETE BY COMPONENT  
AT PACD (30 JUNE 1992)

	Percent Complete (30-6-92)
1.0 Farmer Organization Development	
1.1 Farmer Organizations	93.00
1.2 Process Documentation	100.00
2.0 Operation & Maintenance Improvement	
* 2.1 Surveys	76.21
* 2.2 Designs	66.14
** 2.3 Construction Wt. Financial	48.07
Construction (Actual/Physical)	32.96
2.4 Systems Operation Improvement	90.67
2.5 Computer Model for Water Management	98.68
2.6 Maintenance Plan	94.15
3.0 Financial Management	98.00
4.0 Monitoring Evaluation and Feedback	100.00
5.0 Training	
5.1 Participant (LT)	100.00
5.2 Participant (ST)	100.00
5.3 In Country	
5.3.1 Institutional Organizers	100.00
5.3.2 Project Engineers	95.00
5.3.3 Irrigation Engineers	93.00
5.3.4 Technical Assistants	97.00
5.3.5 Work Supervisors	93.00
5.3.6 Farmers	100.00
6.0 Agronomy/Crop Diversification	93.00
7.0 Research	100.00
8.0 Procurement	85.00
	-----
OVERALL PROJECT % COMPLETE (30/6/92)	79.00

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216

IRRIGATION SYSTEMS MANAGEMENT PROJECT  
LIFE-OF-PROJECT PROGRESS CHART

AS OF QUARTER ENDING 30 JUNE 1992

75% SCHEDULED COMPLETE  
60% ACTUAL COMPLETE

EXHIBIT - J

1990	1991	EXTENSION
0 1 2 3 4 5 6 7 8 9 10 11 12	0 1 2 3 4 5 6 7 8 9 10 11 12	00 100
0 1 2 3 4 5 6 7 8 9 10 11 12	0 1 2 3 4 5 6 7 8 9 10 11 12	00 100

LEGEND REPORTING PER

\* REFLECTS CORRECTIONS IN PHYSICAL PROGRESS OF CONSTRUCTION AS OF 31 DEC. 1989

WORK COMPONENT / ITEM	LOP % WEIGHT	% COMPLETE TO DATE	COMPLETION % LOP BASIS	1987	1988	1989	1990	1991	1992	100%													
<b>I. INSTITUTIONAL DEVELOPMENT</b>	16.5																						
A. FARMER ORGANIZATIONS (201 DCO'S)	11.50	93.00	10.695	0	5	18	12	15	19	28	37	46	55	61	67	74	80	85	90	93	96	100	
B. PROCESS DOCUMENTATION	5.00	100.00	5.000	0	1	13	15	18	10	125	140	155	175	177	178	178	180	182	185	188	190	95	100
<b>2. OPERATIONS AND MAINTENANCE</b>	56.5																						
A. ESI / REHABILITATION																							
I. SURVEYS	2.72																						
a. MAIN CANALS (90.71 KM)	0.55	95.60	0.526	0	20	44	44	44	44	56	64	60	93	94	95	95	100						
b. BRANCH CANALS (150.81 KM)	0.55	100.00	0.550	0	12	42	142	143	44	44	151	157	164	170	160	167	100						
c. DISTRIBUTORY CANALS (561.54 KM)	0.54	92.57	0.500	0	18	22	126	130	35	139	145	146	52	158	164	170	75	84	87	88	90	95	100
d. FIELD CHANNELS (1172.02 KM)	0.54	76.91	0.415	0	16	16	120	22	23	129	135	142	48	154	160	166	75	181	187	93	98	100	
e. DRAINS (245.00 KM)	0.54	15.20	0.082	0	0	0	0	12	12	13	118	132	145	60	70	100	60	70	100	100	100	100	
ii. DESIGNS	5.44																						
a. MAIN CANAL (90.71 KM)	1.10	95.60	1.052	0	20	42	142	143	44	44	151	157	164	170	160	167	100						
b. BRANCH CANAL (150.81 KM)	1.10	96.50	1.062	0	20	42	142	143	44	44	147	153	158	170	162	167	100						
c. DISTRIBUTORY CANAL (561.54 KM)	0.08	56.31	0.715	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
d. FIELD CHANNELS (1172.02 KM)	0.08	64.36	0.695	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
e. DRAINS (245.00 KM)	0.08	6.60	0.073	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
iii. CONSTRUCTION	36.60																						
a. MAIN CANAL (90.71 KM)	7.2	84.80	6.935	0	20	42	142	143	44	44	151	157	164	170	160	167	100						
b. BRANCH CANAL (150.81 KM)	7.2	86.80	6.660	0	20	42	142	143	44	44	147	153	158	170	162	167	100						
c. DISTRIBUTORY CANAL (561.54 KM)	7.14	42.86	3.050	0	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
d. FIELD CHANNELS (1172.02 KM)	5.00	28.25	1.410	0	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
e. DRAINS (245.00 KM)	0.02	2.86	0.025	0	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
B. OPERATIONS																							
I. OPERATIONS PLAN	6.20																						
a. PSS (19712 HA)	0.01	90.00	0.001	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
b. MINNERIYA (8923 HA)	0.01	90.00	0.001	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
c. GIRITALE (3035 HA)	0.01	100.00	0.000	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
d. KAUDULLA (4297 HA)	0.01	50.00	0.025	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
e. RIDI BEDI ELA (2630 HA)	0.01	90.00	0.001	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
f. GAL OYA (19,225 HA)	0.01	100.00	0.001	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
ii. COMPUTER MODEL	2.72																						
a. PSS (19712 HA)	1.46	95.00	0.41	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
b. MINNERIYA (8923 HA)	1.46	95.00	0.41	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
c. GIRITALE (3035 HA)	1.46	100.00	0.450	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
d. KAUDULLA (4297 HA)	1.45	98.00	0.441	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
e. RIDI BEDI ELA (2630 HA)	1.45	100.00	0.450	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
f. GAL OYA (19,225 HA)	1.46	95.00	0.451	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
C. MAINTENANCE	2.72																						
I. MAINTENANCE PLAN																							
a. PSS (19712 HA)	1.46	95.00	0.421	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
b. MINNERIYA (8923 HA)	1.46	95.00	0.421	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
c. GIRITALE (3035 HA)	1.46	100.00	0.460	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
d. KAUDULLA (4297 HA)	1.45	95.00	0.424	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
e. RIDI BEDI ELA (2630 HA)	1.45	90.00	0.421	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
f. GAL OYA (19,225 HA)	1.46	95.00	0.451	0	16	20	35	44	50	55	60	66	71	77	82	85	90	95	100				
3. FINANCIAL MANAGEMENT	2.5																						
4. MONITORING EVALUATION & FEEDBACK (200 DCO)	4.0																						
5. TRAINING	7.5																						
A. PARTICIPANT (LT)	(109)	0.01	90.00	1.010	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
B. PARTICIPANT (ST)	(160)	0.01	100.00	1.600	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
C. IN COUNTRY																							
I. INSTITUTIONAL ORGANIZERS (381)	1.15	100.00	1.150	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
II. PROJECT MANAGERS (20)	0.65	95.00	0.618	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
III. IRRIGATION ENGINEERS (20)	0.40	93.00	0.372	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
IV. TECHNICAL ASSISTANTS (450)	0.60	97.00	0.582	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
V. WORK SUPERVISORS (450)	0.70	93.00	0.651	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
VI. MEMBERS (20,000)	1.00	100.00	1.000	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6. RESEARCH (STUDIES)	3.0																						
7. PROCUREMENT	10.0																						
TOTALS	100.0																						

ACCOMPLISHMENT (% LOP BASIS)

BEST AVAILABLE COPY

EXHIBIT D-2

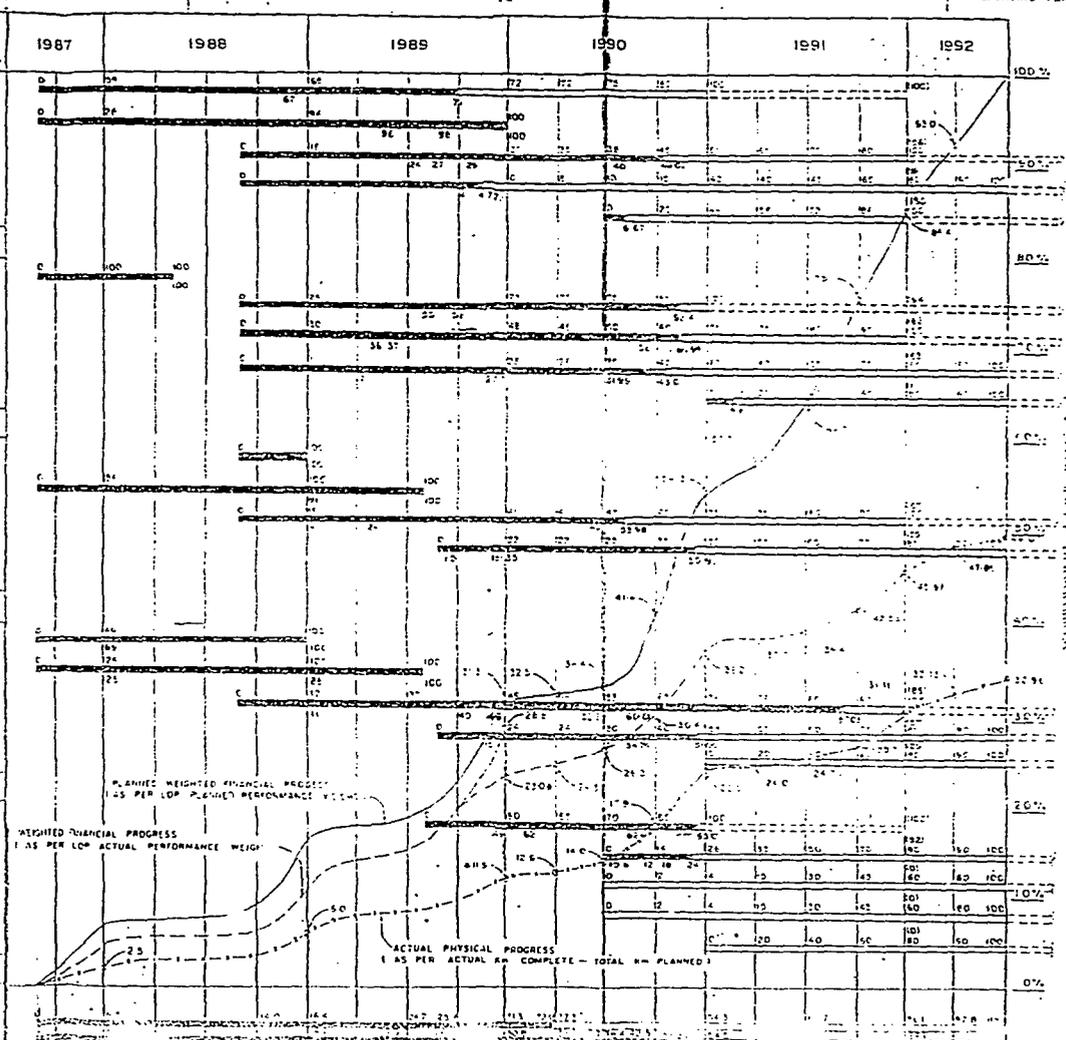
ISMP LOP  
CONSTRUCTION PROGRESS CHART  
AS OF QUARTER ENDING 31 MARCH 1992

100% REVISED SCHEDULE (1 JAN 1991)  
75% SCHEDULE COMPLETE  
60% ACTUAL COMPLETE

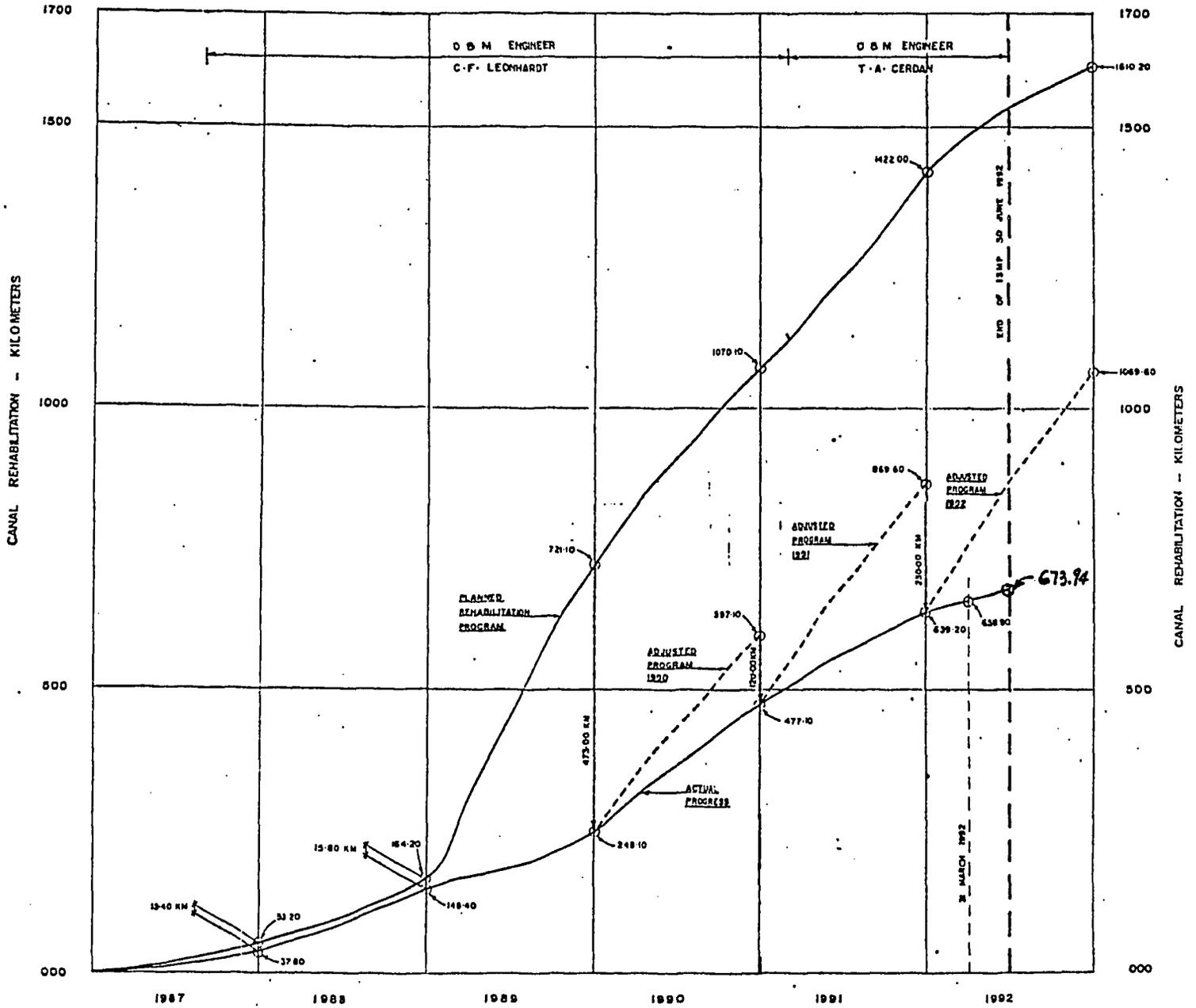
1990	1991
100	100
75	75
60	60

LEGEND — REPORTING PERIOD

SCHEME	DESCRIPTION OF WORK	TOTAL ESTIMATED LENGTH (KM)	ESTIMATED COST (Rs. x 10 <sup>7</sup> )	FINANCIAL LOP PERFORMANCE WEIGHT %	COMPLETED KM AS OF 31-MAR 1992	% COMPLETE TO DATE	FINANCIAL PERFORMANCE WT. TO DATE %
PARAKRAMA SAMUDRA	MAIN CANALS	27.74	11.050	3.04	19.74	71.16	2.16
	BRANCH CANALS	19.85	9.515	2.60	19.89	100.00	2.60
	DISTRIBUTORY CANALS	176.00	45.31	12.42	181.00	46.02	5.72
	FIELD CANALS	266.24	22.582	6.19	12.70	4.77	2.22
	DRAINS	45.00	1.890	0.52	2.00	6.67	0.02
	SUB-TOTAL	534.67	90.381	24.77	156.23	29.46	13.74
MINNERIYA	MAIN CANALS	15.00	7.506	2.17	15.00	100.00	2.17
	BRANCH CANALS	16.77	10.263	2.82	15.50	92.43	2.6
	DISTRIBUTORY CANALS	98.21	23.600	6.47	65.85	66.96	4.22
	FIELD CANALS	247.70	15.511	3.47	55.06	22.22	2.22
	DRAINS	63.00	2.730	0.75	4.00	6.35	0.02
	SUB-TOTAL	440.76	64.615	17.67	195.44	44.33	11.5
DIRITALE	MAIN CANALS	5.00	2.144	1.58	5.00	100.00	1.58
	BRANCH CANALS	10.70	3.016	1.59	10.70	100.00	0.97
	DISTRIBUTORY CANALS	36.90	6.236	1.26	21.02	56.96	1.20
	FIELD CANALS	118.00	10.883	2.98	54.30	45.93	1.52
	DRAINS	—	—	—	—	—	—
	SUB-TOTAL	170.30	24.280	6.52	97.62	57.32	3.50
KAUDULLA	MAIN CANALS	7.17	2.728	0.75	7.17	100.00	0.75
	BRANCH CANALS	15.41	7.257	1.00	15.41	100.00	2.00
	DISTRIBUTORY CANALS	73.27	16.950	4.55	63.77	86.99	4.04
	FIELD CANALS	312.53	01.80	0.50	155.25	49.67	1.50
	DRAINS	25.00	1.470	0.4	1.00	4.00	0.00
	SUB-TOTAL	443.48	29.205	12.70	249.76	56.33	10.31
CALOYA-RE	MAIN CANALS	35.20	24.640	6.75	23.44	66.60	6.41
	BRANCH CANALS	84.00	33.464	5.17	20.16	24.00	2.20
	DISTRIBUTORY CANALS	175.00	49.671	13.57	0.00	0.00	0.00
	FIELD CANALS	227.40	19.379	5.30	0.00	0.00	0.00
	DRAINS	100.00	4.200	1.15	0.00	0.00	0.00
	SUB-TOTAL	621.60	131.508	36.04	53.60	8.62	0.61
TOTALS	2220.08	364.932	100.00	725.78	32.74	18.07	



IRRIGATION SYSTEMS MANAGEMENT PROJECT  
 POLONNARUWA RANGE  
 REHABILITATION WORK PROGRAM 1987-1992  
 SCHEDULED AND ACTUAL PROGRESS

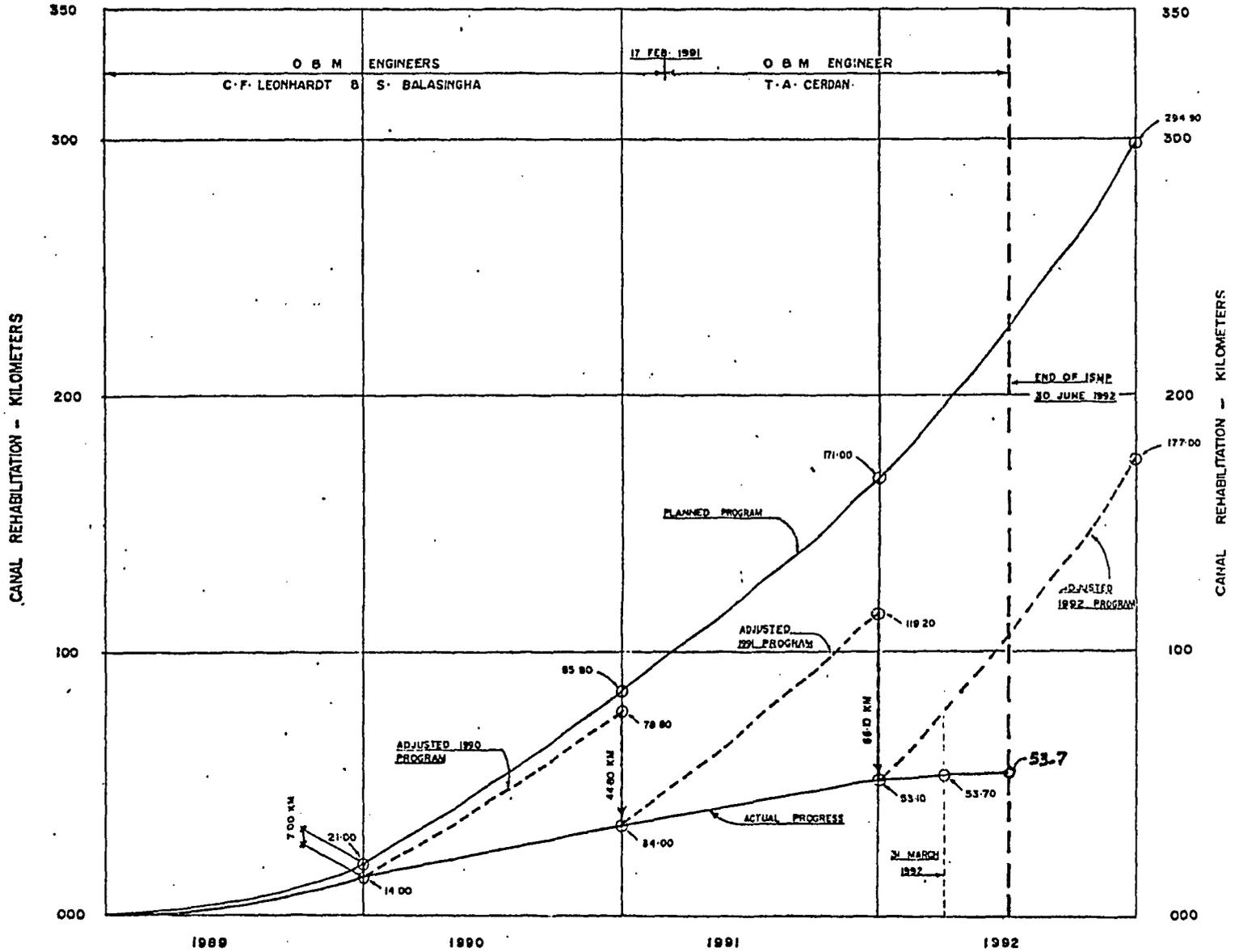


215

IRRIGATION SYSTEMS MANAGEMENT PROJECT  
 AMPARA RANGE

PRAGMATIC REHABILITATION WORKS GAL OYA RBMC  
 1989 TO 1992

PLANNED PROGRAM & ACTUAL PROGRESS



ANNEX V  
LIST OF VIP TO VISIT ISMP

During the LOP several VIPs visited the Project to review the Status of the Project and to evaluate performance and achievements accomplished. A list of some these important visitors are listed on the following table:

VIP's TO ISMP

<u>DATE</u>	<u>VISITORS NAME</u>	<u>DESIGNATION / ORGANIZATION</u>
12/3/1990	Marion V. Creekmore	US Embassy
24/7/1990	Richard Brown	Director USAID
29/7/1990	Donald Westmore	US Embassy
29/7/1990	Richard Brown	Director USAID
29/7/1990	Dan Jenkins	Project Officer IMD
5/9/1990	Ms. Audrey Lutz	Sheladia Associates Inc
5/9/1990	G.T. Jayawardena	Project Director IMD
6/9/1990	Richard Brown	Director USAID
6/9/1990	J. Pinney	C.E. USAID
6/9/1990	Ms. A. Lutz	Sheladia Associates Inc
6/9/1990	D. Jenkins	Project Officer USAID
18/8/1990	Tunisia Team / Officers	Various / IIMI / USAID
28/7/1990	Asst. Gen. Manager	Bank of Ceylon
13/8/1990	Perakumara Erituweli	National Development Bank
16-16/10/1990	Perakumara Erituweli	National Development Bank
28/11/1990	Henrietta H. Fore	Asst. Director USAID
28/11/1990	Richard Brown	Director USAID
28/11/1990	Donald Creekmore	Deputy Chief of Mission US Embassy
28/11/1990	J. Pinney	C.E. USAID
28/11/1990	G.T. Jayawardena	Project Director/IMD
28/11/1990	S. Jayasinghe	GA Polonnaruwa
17/11/1990	Delegation of Water Resources	Govt's Thailand / Indonesia Malaysia / Philippines
12/4/1991	Ms. A. Lutz	Sheladia Associates Inc
17/4/1991	Ms. A. Lutz	Sheladia Associates Inc
17/4/1991	Dan Jenkins	Project Officer/USAID
17/4/1991	Delegation of Water Resources Specialist	Govt. of Bangkok
23/9/1991	Mr. Gunning	Coor. Officer USAID Washington
23/9/1991	Glen Anders	Agric. Officer / USAID
12/10/1991	Dr. Roskins	Administrator USAID / Washington

<u>DATE</u>	<u>VISITORS NAME</u>	<u>DESIGNATION / ORGANIZATION</u>
12/10/1991	Richard Brown	Director / USAID
12/10/1991	Donald Brown	Deputy Chief of Mission US Embassy
12/10/1991	Ms. A. Lutz	Sheladia Associates Inc
12/10/1991	J. Pinney	C.E. USAID
12/10/1991	G.T. Jayawardena	Prooject Director / IMD
12/10/1991	S. Jayasinghe	GA Polonnaruwa
8/2/1992	G. Anders	Agr. Resources USAID
3/3/1992	Phyllis Forbes	Asia Asst. USAID Washington
19/3/1992	S. Pakulski	VOCA Regional Director
3/4/1992	G. Jones	Deputy Director USAID
3/4/92	G. Anders	Agr. Resources USAID
13-14/5/1992	.....	USAID Regional Office Singapore
18/4 to 26/6/1992	Ms. J. Michael	VOCA Trainer
9-10-6/1992	S. Pakulski	VOCA Regional Director

ANNEX VI  
WORKSHOPS CONDUCTED OVER LOP

There were many workshops held during the LOP which had a great effect to help in implementing the ISMP. A list of these Workshops follows:

Date	Subject/Title of Workshop
17-18	Jun 1992 National workshops on cost effective modernization
2	2 June Cost effective modernization workshop
5-7	Feb 1992 MEF Workshop
20-22	Jan 1992 MEF Workshop
14-15	Nov 1992 Annual Work Plan Workshop
8	Oct 1991 Maintenance of Major Irrigation Systems
7	March 1991 Workshop at Seruwa ISMP Evaluation
21-24	March 1991 Workshop MARD
26	March 1991 Agricultural Implementation Program
25	Feb 1991 MEF Workshop
1	Feb 1991 Hakwatunaoya WM Workshop
18	Feb 1991 IMPSA Workshop
22	Feb 1991 RBE - Crop Diversification Workshop
4-5	Dec 1990 1991 Annual Workshop Work Plan
27	Dec 1990 Entrepreneurial Workshop
30	Nov 1990 IMSA Workshop
25	Aug 1990 Workshop for strengthening RBE FOs
13	July 1990 SID Workshop
26-28	July 1990 Farmer Organizing Workshop
15	June 1990 Institutional Development Work Shop
1	March 1990 Annual Work Plan MARD Project Workshop
6	March 1990 Crop Diversification Workshop
21-24	March 1990 ISMP Mid-Term Evaluation Review Workshop
27	March 1990 Crop Diversification Workshop

ANNEX VI  
WORKSHOPS CONDUCTED OVER LOP

There were many workshops held during the LOP which had a great effect to help in implementing the ISMP. A list of these Workshops follows:

Date	Subject/Title of Workshop
7, 12, 18	Feb 1990 MEF Workshop
22-24	Feb 1990 IIMI Workshop
2	Feb 1990 DCO Management Workshop
14	Dec 1989 USAID Assessment Review
7	Dec 1989 TEAMS Workshop
1	Nov 1989 1990 Annual Work Plan Workshop
6-10	April 1989 ISPAN Project Review Workshop
3	Nov 1988 1989 Annual Work Plan Workshop
22	Dec 1987 ISMP 1988 Annual Work Plan Workshop
25	Oct 1987 ISMP Review Workshop, Polonnaruwa
10	Sept 1987 ISMP Implementation Workshop, Colombo
22	Jul 1987 ISMP Project Orientation Workshop Riverdale, Maryland

wkshps

VI-2

220

ANNEX VII

DIRECTIVE FROM DIRECTOR OF IRRIGATION ON HANDING  
OVER DISTRIBUTORY CANAL SYSTEM TO DCFO's

Department Circular No.01 of 1989

My No. 70-00404  
Irrigation Department  
Colombo 07

13 - 01 -1 1989

D.D..... Range

I.E.,..... Division

SUB: HANDING OVER OF DISTRIBUTORY & FIELD CANALS FOR  
OPERATION & MAINTENANCE, TO FARMER ORGANIZATIONS

Further to my letter of even number 1988-05-23, the following procedure should be followed in handing over of the already identified channels to the farmer organizations in the irrigation schemes under this INMAS project. The same procedure should be followed in all other schemes if & when the decision are made to hand over the distributory canals.

1. Turn out attendants who are presently attending to the operation of gates in the selected canals which are handed over should be withdrawn.
2. Turnout attendants should be re-assigned within the rest of the canals not exceeding the norm of one turnout attendant per 500 Ac. If they are in excess, they should be employed elsewhere on maintenance work & if such work is also not available their service should be terminated. However if they belong to the permanent cadre where you do not have the authority in terminating the services such cases should be referred to me to be transferred to places where there are shortages of such employees. All should therefore inform me about the shortages of turnout attendants within the schemes as well.
3. Farmer Organizations should be paid an amount calculated on the following basis for operating the canals that are handed over to them. Amount to be paid per annum

$$\frac{A \times B \times F \times S}{500}$$

Where A = Area in acres operated by the farmer organization

B = Monthly wage of a turnout attendant computed on the

basis of daily casual wage and allowances, 30 days.  
 F=0.5 (Factor to take in to account the departmental overheads for supervision in the canals handed over & for the operation of the rest of the system that will also affect the operation of the canals that are handed over)  
 500 Acs is assumed to be the Departmental norm for a turnout Attendant.

This total annual amount is to be paid in two installments to the farmer organization for regular payment by them to the farmers engaged by them on operation of the canals. As far as possible each payment should be made to the farmer organization a week prior to the first date of water issue for the ensuing season as decided at the Kanna meeting. If the canal handed over to the farmer organization are not required to be operated during a season due to non-cultivation arising from lack of water for the season, both ma cultivation, canal rehabilitation or any other reason, the I.E should inform the D.D.of the range and Director I.M.D. and the saving of the funds for that season can be used by the his normal work.

#### Maintenance

1. No maintenance other than major repairs to structures should be done by the department in the canals that are handed over to the farmer organization. All other maintenance work will be the responsibility of the farmer organization.

However any earth filling requiring more than one cube of earth in distributory canal should be costed as a separate work item and cost should be charges to Improvements to water management. Such work can be given on contract to the Farmer Organization on measurement basis. If the Farmer Organization does not undertake the work it can be awarded under the normal contract procedures to any other contractor. This arrangement of separate costing should be limited to the first two years since such large scale earth-work is likely to be higher priority within a scheme.

2. On satisfactory completion of maintenance work, the farmer organization should be paid an amount calculated on the following basis, for maintaining the distributory canals that are handed over. The first step in working out the allocation to the farmer organizations involves the proportioning (Ap) of funds for the maintenance of the D channels and F.CC (that are currently maintained by the pt. if any) handed over.

$$A_p = \frac{\text{Total maintenance alloc. for all canals} \times (L + 1.51d)}{(L + 1.5 L + 2.5 L)}$$

$$(L + 1.5 L + 2.5 L)$$

L = total length of P.CC maintained by the L.D. prior to handing over

L = total length of branch channels and D chls. maintained by the I.D. prior to handing over

L = total length of Main channels.  
1.5 and 2.5 are the weight adopted in the distribution of allocation for canal maintenance.

Then the amount to be paid annually to the farmer organization can be calculated by the following expression.

$$\text{Amount to be paid annually} = \frac{L \times A \times C}{(L + L)}$$

Where L = length of D-Canals and F.cc (currently maintained by I.D) handed over to the farmer organization

L = total length of Branch canals, D-canals & F.CC (maintain by I.D.) in the system maintained by the Department after handing over.

C = 0.8  
(A factor to account for the retention Deptl. overheads for supervision)

This payment may be made in installments to the farmer organization. Agreement should be reached between the Department & the farmer organization at the Project Committee at the beginning of the year as to the work to be done on maintenance during each season and the instalment of payment that should be made after the satisfactory completion of the seasons work.

#### General

1. At the beginning of the year, I.E should inform the farmer organization of the amounts available for payments to the farmer organization for both operation & maintenance of the canals handed over to them, computer as explained above.
2. Farmer organization should be given technical advice and assistance regarding both the operation & maintenance and their work should be closely supervised.
3. Participation of T,AA & M.SS in the sub project committees should continue, to ensure a constant and health dialogue for co-operation, advice and supervision. The observations by the Department on maintenance work done by the farmer organization should be brought to the notice of the farmer organization while the work is in progress for any rectification required, thus avoiding the possibility of a disagreement at the time of payment after the work has been completed.

while the work is in progress for any rectification required, thus avoiding the possibility of a disagreement at the time of payment after the work has been completed.

4. The payments for completing the agreed maintenance programme of work by the farmer organizations should be made as lump sum payments on the satisfactory completion and after a joint inspection by the I.E. and farmer organization. The funds available on computation as above out of the inadequate maintenance allocation received by the Department are likely to be much smaller than the value of work actually performed by the farmer organization working on virtually a voluntary basis. The payments made will therefore be only a service payment for the maintenance of the canal rather than an adequate payment for the work done.
5. Any disputes regarding the work that cannot be settled at the field level should be resolved at the Irrigation Sub Committee of the D.A.C
6. All payments should be made in favour of farmer organization in to their official bank account. Normal financial regulations pertaining to payments should be followed in making the payments. In this regard the I.E. should enter in to a service contract agreement with the farmer organization signed on a small scale agreement forms for providing the above service on the guide lines stipulated in the I.D. circulars No. 26 & 33 of 1986.
7. Specifications to be used in assessing the quality and standard of work are annexed.

Eng. K.D.P.Perera,  
Director of Irrigation

Copy to Director, I.M.D. - for information

Annexed: A copy of my even no letter of 1988-05-23 where the criteria of selection for handing over distributory canals for O & M is described.

## Specification for Maintenance of Handed over Irrigation Systems

0 Following tasks are identified under maintenance.

I Maintenance of Irrigation canals (Both D-canals & F.CC)

- i. Weeding & J/C
- ii. Desilting
- iii. Earth Work
- iv. Minor repairs to structures

II Maintenance of Drainage canals

III Maintenance of canal roads & tracks

I Maintenance of Irrigation canals

i Weeding & J/C

This includes the extermination of weeds (weeds must not be cut but pulled out by the roots) and the cutting of grass in the reservations as well as in the canals, stumps remaining should be up rooted and all dead trees branches should be burnt or disposed otherwise. Salvinia, water hyacinth & similar hydro plants should be removed, from water surface, dried and burnt. The weeding & J/C operation should be done at least twice every season. Once before water issues & once after two months of issue.

ii Desilting

Silt should be removed to the levels given, by I.D. The removed silt should be deposited away from the canal so that it will not be brought back to the canal later by rain. Desilting should be done at least once a season before the commencement of that season.

iii. Earth Work

This includes ant-hill removal, filling of repairs to bund slope and top.

Before and filling is done all vegetation should be removed by up rooting. All loose earth should be removed and where appropriate scarifying or benching should be done and the prepared surface should be adequately moistened. Filling should be done using a selected material with an optimum amount of water & compacted properly. All such new fillings should be dress with turfing.

iv. Maintenance & Minor Repairs to Structures

Any fallen pitching should be replaced. Scours near

masonry structures should be patched up promptly & turfed, leaks should be mended with earth, clay, turf etc. Weeds in joints & cracks and other obstructions should be pulled out immediately. Planks should be properly fitted and tarred. All steel parts except contact surface should be painted with anti corrosive paint. Contact surfaces of moving parts should be greased.

## II Maintenance of Drainage canals

All obstruction in drainage canals should be promptly removed and they should be kept in good condition for proper functioning.

## III Maintenance of canal roads and tracks

Every canal should have at least a road for O & M. Slight camber should be provided in each case so that rain water is able to run off rapidly. Lumps must be cut off and the hollows filled up. Only gravel (not earth should be used in surface dressing the roads. Proper side drains should be provided where necessary.

## Specification for Operation of Handed Over Irrigation System

O Following tasks are identified under operation.

- I Equitable Distribution within the system.
- II Distribution according to the delivery schedule
- III Safety of the system

I Equitable Distribution within the system

This includes the operation & controlling of all gates & gated arrangement in the system handed over in such a manner as to provide equitable distribution of water among all farmers in the system.

Ii Distribution according to a delivery schedule

This means that operation should be done according to a delivery schedule prepared by I.D with the consensus of the farmers. This is to ensure that operations within the handed over system is with the operation of the rest of the system.

III Safety of the system

This includes careful operation of gates to ensure their safety and to protect them from damage & theft.

Annexure

My. No. 70-00404  
Irrigation Department  
Colombo - 07  
23rd May 1988

D.D..... Range

I.E..... Division

SUB: HANDING OVER OF DISTRIBUTORY & FIELD CANALS FOR  
OPERATION & MAINTENANCE, TO FARMER ORGANIZATIONS

A request has been made by the Director IMD that operation and maintenance of distributory channels be handed over to farmer organization if the project committee and the INMAS Project Manager makes such a request. Since the maintenance of the field channels is the responsibility of the farmers, even at present, this involves the handing over of operation of field channels where controlled individual farm outlets are available and both operation and maintenance of distributory channels to the farmer organizations in the future. The following procedure should be adopted in handing over.

- (1) A written request should be made to the Divisional I.E. by the Project Committee through the Project Manager after a formal decision at a Project Committee meeting to hand over the operation & maintenance of the distributory channels. The request should cover an area which includes all the field channels under a distributory channel or a sub-distributory channel in such a manner as to avoid the joint operation by both the Departmental staff and the farmer organization on the turnouts in the same distributory channel.
- (ii) The Divisional I.E., should forward the request to the Range D.D., with the recommendations about the request identifying the canals and the structure where the operation and maintenance is to be handed over. The recommendation should also indicate what should be done to the employees of the Dept. after the handing over.
- (iii) The Range D.D., will inform the Division I.E., about his decision. The Range D.D., should also keep me informed of all decisions to hand over the maintenance and operation of distributory channels and the action taken regarding the Departmental employees.
- (iv) In making the recommendations by the I.E. and in taking the decision by the Range D.D., the capability of the farmer organization to operate and maintain the D-channels should be examined.

Maintenance of D-channels should not be entrusted if the field channels which should be maintained by the farmers under the present procedure are not satisfactorily maintained by them.

- (v) I.E. should ensure that gates & accessories in the structures are in working order in the areas where handing over is done. Any repairs required should be done before the handing over meeting the expenses from the maintenance funds already available. However in case, where excessive repairs have to be done and where the cost cannot be accommodated within the available funds, additional requirements of funds should be sought from I.M.D.
- (vi) An acknowledgement by the Project Committee witnessed by the Project manager including the details of the channels thus taken over should be obtained by the I.E., after the handing over of the operation and or maintenance to the farmer organization. A copy should be forwarded to the Range D.D., by the I.E., keeping the head Office also informed.
- (vii) The mode of payment to farmer organization for the operation of canals is being worked out jointly by the Department and the I.M.D. Further instructions will follow.

Sgd./Eng.K.D.P.Perera  
Director of Irrigation

## ANNEX VIII

LIST OF DISPOSITION OF NON-EXPENDABLE EQUIPMENT  
(VALUE US\$ 500.00 OR MORE)

Sneladia Associates Incorporated purchase equipment under the Project for it's Colombo and Polonnaruwa Offices and for it's expatriate staff for household effects (Furniture/Apliances) during the LOP. A list of the equipment purchased that is estimated to be over US\$ 500.00 in value is present in the tables that follow.

## VIII-1 SAI POLONNRUWA OFFICE EQUIPMENT

ITEM NO.	QUANTITY	SERIAL NO	ITEM DESCRIPTION
1	1	SL 411236	KAYPRO COMPUTER 286i
2	1	70304145	KAYPRO MONOCHROME MONITOR
3	1	15001058	BTC PROFESSIONAL KEY BOARD
4	1	103000904	EPSON FX 1000 PRINTER
5	1	133E211 223306	XEROX PHOTO COPY MACHINE - MODEL 1025
6	1	170300045	WEST POINT REFRIGERATOR
7	1	MM - 09BV	mitsubishi AIR CONDITIONER (900 BTU)
8	1	MM - 09BV	mitsubishi AIR CONDITIONER (900 BTU)
9	1	MM - 09BV	mitsubishi AIR CONDITIONER (900 BTU)
10	1		LIGHT TABLE
11	1	HP - 285	ELMO OVERHEAD ROJECTOR
12	1	620 91187	UPS CELLAC W/BATTERY

APPDXVIII-1.WK1

## VIII-2 SAI COLOMBO OFFICE EQUIPMENT

ITEM NO.	QUANTITY	SERIAL NO	ITEM DESCRIPTION
1	1	WX - 286i	1 UNIT NITSUKA TELEPHONE SYSTEM - WX-2066
			1 NO. INSP - MS 10
			15 NO. INSP - MS 9
2	1	409690	KAYPRO COMPUTER 286i
3	1	KP - 1254GE	KAYPRO MONOCHROME MONITOR
4	1	170119590	BTC PROFESSIONAL KEY BOARD
5	1	602065543	NEC PINWRITER PRINTER P2200
6	1	264070600079	STAR PRINTER NB24-15
7	1	417289	KAYPRO COMPUTER 286i
8	1	170300363	KAYPRO MONOCHROME MONITOR
9	1	ES 62060129	CELLAC UPS W/BATTERY
10	1	61133899	KEY BOARD
11	1	ES 62030011	CELLAC UPS W0/BATTERY
12	1	2112233060	XEROX PHOTOCOPY MACHINE - MODEL 1038
13	1	DUO III	NSC BOOK BINDING MACHINE
14	1	ID-1310210032115	1 MURATA F-1 FAX MACHINE WITH TELEPHONE UNIT

APPDXVIII-2.WK1

## ANNEX VIII (Cont.)

## VIII-3 FURNITURE/APPLIANCES C.F. LEONHARDT HOUSE

ITEM NO.	QUANTITY	SERIAL NO	ITEM DESCRIPTION
1	1	SL 1000819	MITSUBISHI AIR CONDITIONER
2	1	SL 100146	MITSUBISHI AIR CONDITIONER
3	1	SL 100039	MITSUBISHI AIR CONTROL SPLIT UNIT
4	1	SL 100142	MITSUBISHI AIR CONTROL SPLIT UNIT
5	1	NOT AVAILABLE	MITSUBISHI AIR CONTROL SPLIT UNIT
6	1	2053037	GAS COOKER (WHITE)
7	1	SL 100023	MITSUBISHI A/C SPLIT CONTROL UNIT
8	1	SL 100059	MITSUBISHI A/C SPLIT CONTROL UNIT (18000 BTU)
9	1	SL 89920124	GOLD STAR REFRIGERATOR MODEL GR-171-AD
10	1	SL 100084	MITSUBISHI AIR CONDITIONER
11	1	SL 100112	A/C CONTROL SPLIT UNIT MITSUBISHI
12	1		NATIONAL REFRIGERATOR MODEL NR-276 TRH
13	1	861003086	GAS COOKER MODEL HCF 458 - US\$ 574.57
14	1		MITSUBISHI A/C 18,000 BTU - M-2-18 AV = US\$ 769.49
15	1		(DINNING ROOM TABLE 8' x 4' OVAL BURM TEAK
16	1		(DINNING CHAIRS CBYLON TEAK
17	1		(SINGLE BEDS
18	1	US\$ 1225.45	(FOAM ROUBBER MATTRESS
19	1		(BED SIDE TABLES - BURMA TEAK
20	1		(CHEST OF DRAWERS - BURMA TEAK
21	1		(SIDE BOARD FOR CHINA WARE - BURMA TEAK
22	1		(DRAWING ROOM SUTE CONSISTING OF 3 SEAT SETEE; (COFFEE TABLE AND 2 STOOLS - US\$ 504.90
23	1		(KENWOOD WASHING MACHINE MODEL NO. 43 - US\$ 472.13
24	1		(CANE FURNITURE SETTEE (3 SEAT)
25	1	US \$ 427.11	(CANE FURNITURE CHAIRS
26	1		(CANE COFFEE TABLE W/GLASS
27	1		(CANE SIDE TABLE W/GLASS
28	1		(UPHOLSTERY FOR CANE FURNITURE
29	1		(DRESSER DRAWER CHEST
30	1	US \$ 368.46	(BED SIDE TABLE - BURMA TEAK
31	1		(KING SIZE BED/MATTRESS/BOX SPRINGS- US \$ 821.46
32	1	16388707000485	(HOOVER ELECTRIC DRYER MODEL NO 63880
33	1	1170203939	(GIBSON AIRCONDITIONER (12000 BTU) - US\$ 722.91
34	1	SL 80200057	(WEST POINT REFRIGERATOR - SINGLE DOOR NO. RS. 6 (G.E. NO. 4040-1 = US \$ 311.20
35	1		(CANDY REFRIGERATOR WHITE (ITALY) MODEL 23/15 (US \$ 574.75
36	1		(BOX FREEZER NO 702 (FRANCE)

APPDYVIII-3.WK1

230

ANNEX VIII (Cont.)

VIII-6 FURNITURE/APPLIANCES S. SAMARAKOONS HOUSE

ITEM NO.	QUANTITY	SERIAL NO	ITEM DESCRIPTION
1	1	SL 70716035	REFRIGERATOR (2 DOOR - GOLDSTAR) - KOREAN
2	1	SL 1980654	GAS COOKER (ELECTROLUX - 4 BURNER) MODEL NO 80-665
3	1	80716071	REFRIGERATOR ( GOLDSTAR SINGLE DOOR) - KOREAN
			MODEL NO GR-171-APSL

APPDIXVIII-6.WK1

VIII-7 FURNITURE/APPLIANCES N.K. ADIKARANGE HOUSE

ITEM NO.	QUANTITY	SERIAL NO	ITEM DESCRIPTION
1	1	SL RS2	REFRIGERATOR (2 DOOR - WESTPOINT)
2	1	SL 908338	TOSHIBA WASHING MACHINE MODEL BH-1410E
3	1	SL 001189	GAS COOKER (WHITE) WEST POINT MODEL FM 4M

APPDIXVIII-7.WK1

221

ANNEX IX

MEF PROGRAM FOR ISMP

A MEF Status/Performance Report for the First Quarter of 1992 is presented in this Annex as a sample of the Reports being issued by IMD to monitor and evaluate the DCFOs in all schemes under the Project. Monthly MIS Reports are issued each month and this Summary Status/Performance Report is issued every Quarter.

232

Monitoring Evaluation & Feedback Programme  
Irrigation Systems Management Project  
(Status / Performance Report for  
1st Quarter - 1992)

The current MEF System developed under ISM Project has 03 components :

- i) Annual / Seasonal Planning to establish targets and schedules of the various programmes
- ii) Management Information System (MIS) for monthly monitoring and feedback
- iii) Seasonal post harvest surveys to evaluate performance periodically

All these components were introduced to the 07 schemes under ISM Project (except Gal Oya (RB) area) during the last year 1991 and continuously this system has been implemented during the first quarter 1992. Specially the Management Information System was introduced as a new component of the MEF Programme and it was field tested in 06 Schemes under ISMP area and in other 10 "INMAS" Schemes outside ISMP areas, during 1991. The main objectives of the implementation of this system (MIS) were :-

- i) To improve the institutional management abilities of the irrigation schemes by providing useful reliable/accurate management information on timely basis.
- ii) To improve the Monitoring of Programme Implementation & Strengthening of on-going Monitoring System for the successful achievement of "INMAS" objectives.

Under this system primary data was provided by the DCO representatives monthly and forty (40) tables of information were regularly produced and disseminated to the relevant implementation agencies.

These tables bring information monthly about the status/performance of various activities of the project and highlight key problem areas. Then relevant implementation agencies were expected to take immediate action to rectify problems and constraints depicted on monthly reports. At the monthly Project Management Committee Meetings this monthly reports were very useful to discuss the relevant problems and constraints on the prioritical basis.

During the 01st Quarter 1992 in January and February, whole MEF System was reviewed by Dr. Kenneth Smith, MEF Specialist and a Workshop / Seminar was held to present findings and recommendations. It was observed that this system had been working well, but to continue with a little modification to the formats and implementation techniques. During the evaluation of the MEF System it was highly taken into consideration, the utility and sustainability of the system, institutionalization of the system and the capacity for future replication to the other "INMAS" Projects.

During the first Quarter 1992, it has been observed that the MEF had a major impact on the Monthly Project Management Committee Meetings and DCO Meetings and in effect changed the nature of the meeting.

Now action is being taken to extend the Monthly MIS Comparative Performance Analysis Reports to the DCO Level within each scheme as an important step of giving feedback to the beneficiaries level. This has to be done manually by the MEF Assistants.

During the first Quarter 1992, the new MEF System was introduced to Damana Area of Gal Oya (RB) Schemes as it was targeted in the annual work plan 1992. Monthly information has been furnished since January from Damana area.

During the last 03 months the status / performance of the main programmes and activities of the 07 schemes under ISM Project has been reported as follows

Programme Element	Performance (Percentage of Satisfactory)		
	January 1992	February 1992	March 1992
Farmer Organisation Development	57 %	52 %	64 %
Maintenance Efficiency	69 %	73 %	75 %
Water Delivery Operations Efficiency	91 %	91 %	68 %
Paddy Production	79 %	80 %	80 %
O.F.C. Production	84 %	86 %	89 %
Off Farm Employment	82 %	80 %	82 %

23/11

Seasonal Post Harvest Survey

The post harvest survey data for Yala 1991, was analyzed and Scheme Level Reports were prepared. This was done by manually by the MEF Assistants of the Schemes. It has been experienced that great effort was taken by the MEF Assistants since data was analyzed manually without computer support.

Now action is being taken to conduct the post harvest survey for last Maha 1991/92 and data is being collected by the enumerators as previously done.

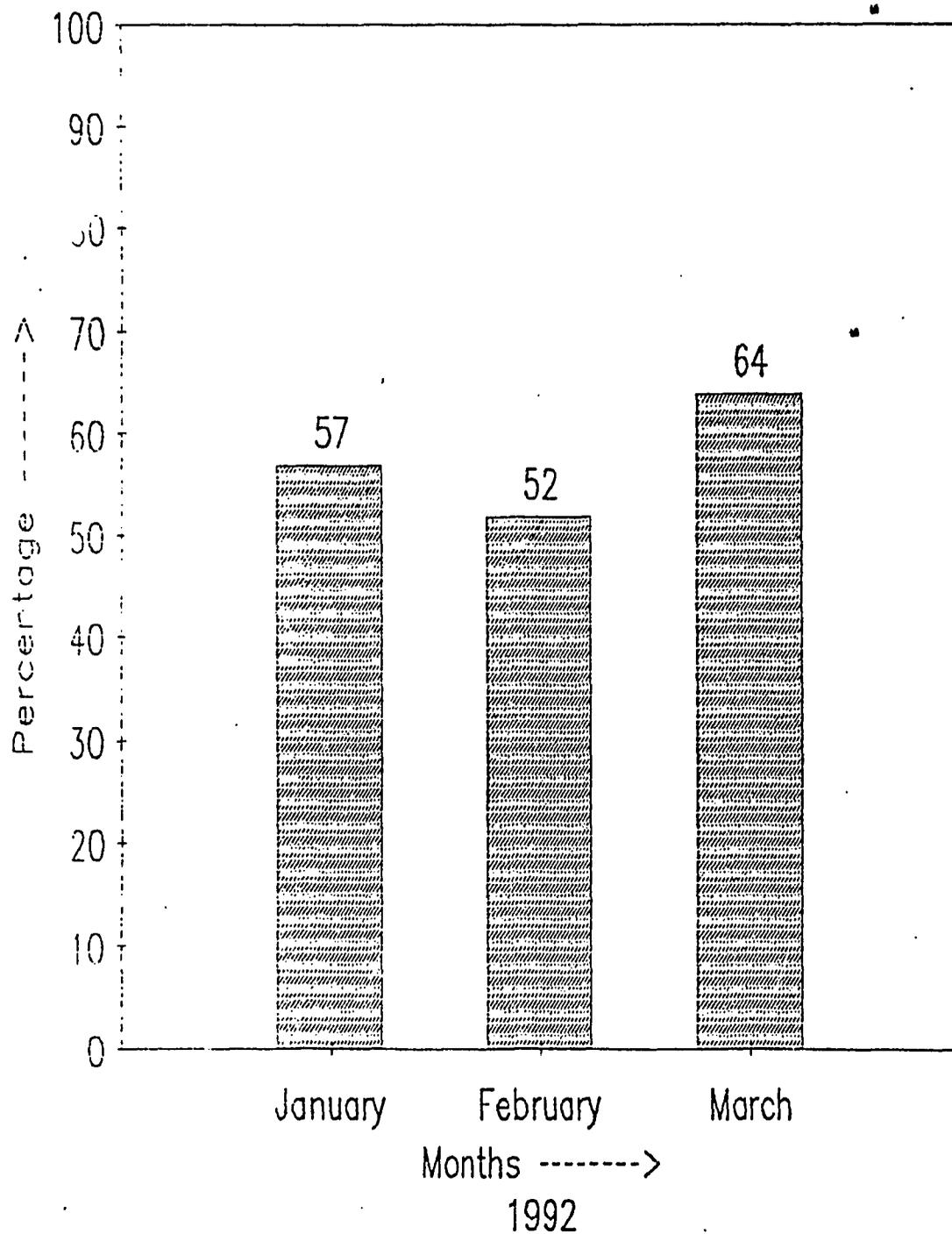
W. ELLAWALA  
Deputy Director (MEF)  
ISM Project.

IRRIGATION SYSTEMS MANAGEMENT PROJECT

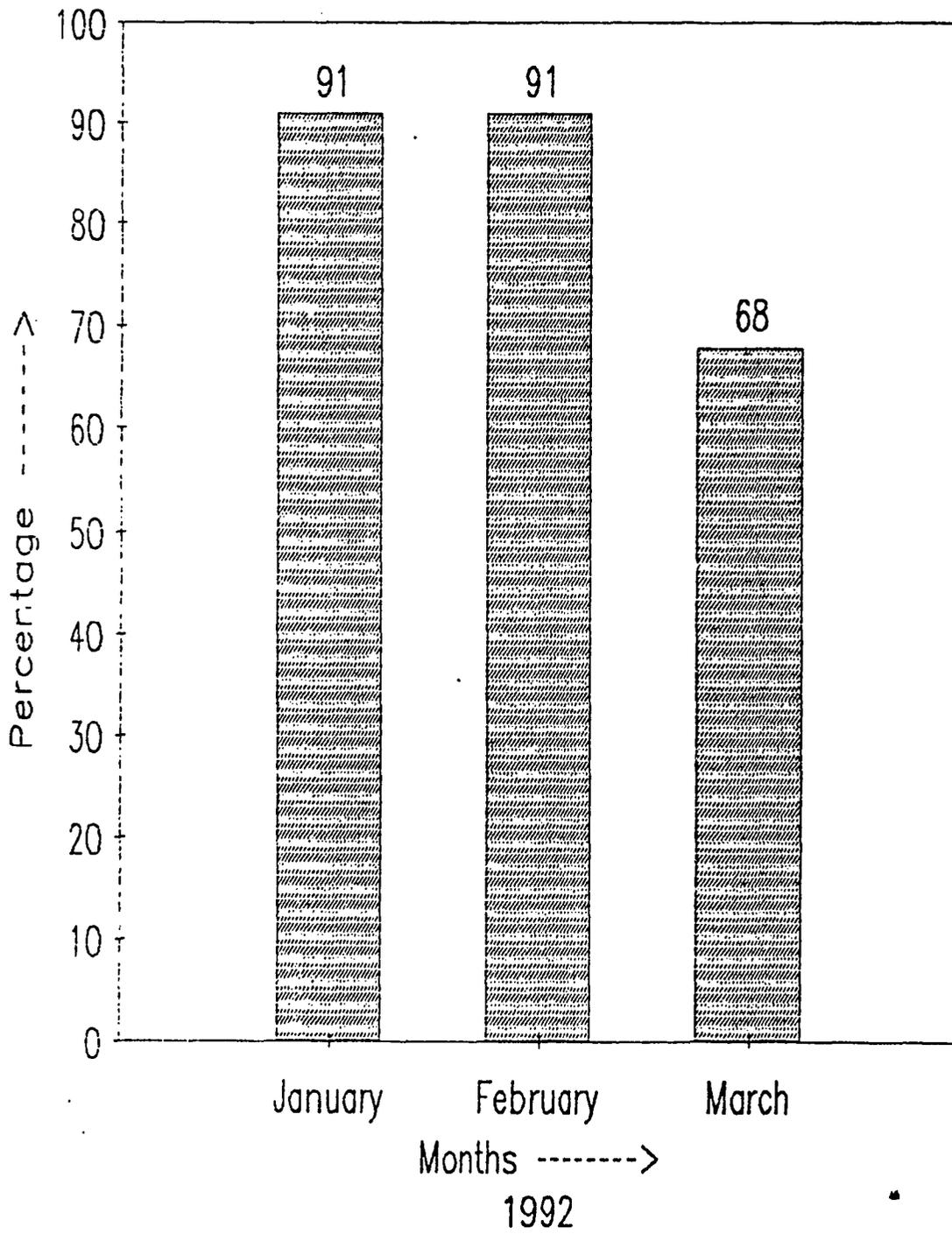
Project Level Performance

(First Quarter - 1992)

Farmer Organisation Development



IRRIGATION SYSTEMS MANAGEMENT PROJECT  
Project Level Performance  
(First Quarter - 1992)  
Water Delivery Operations Efficiency

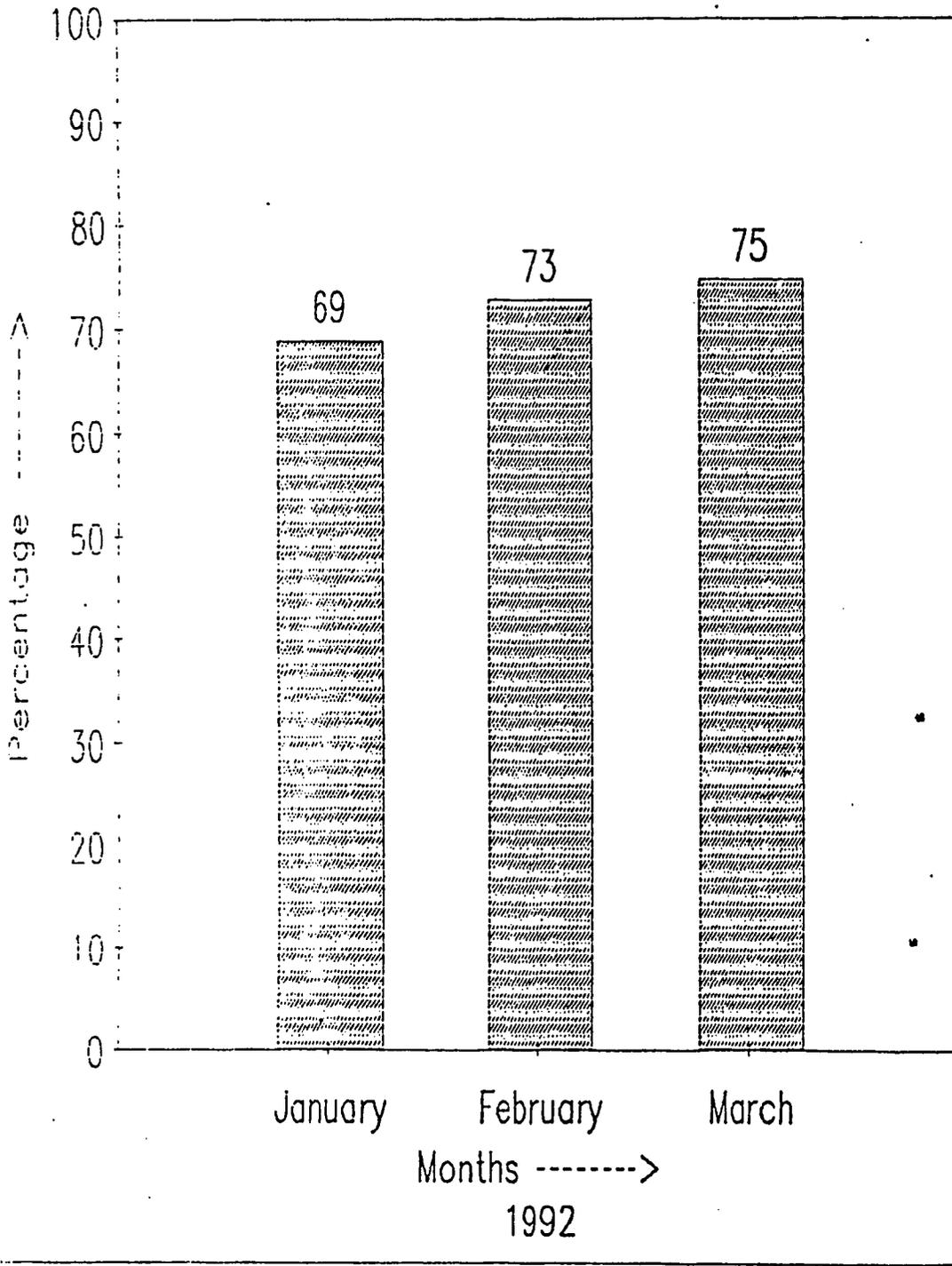


IRRIGATION SYSTEMS MANAGEMENT PROJECT

Project Level Performance

(First Quarter - 1992)

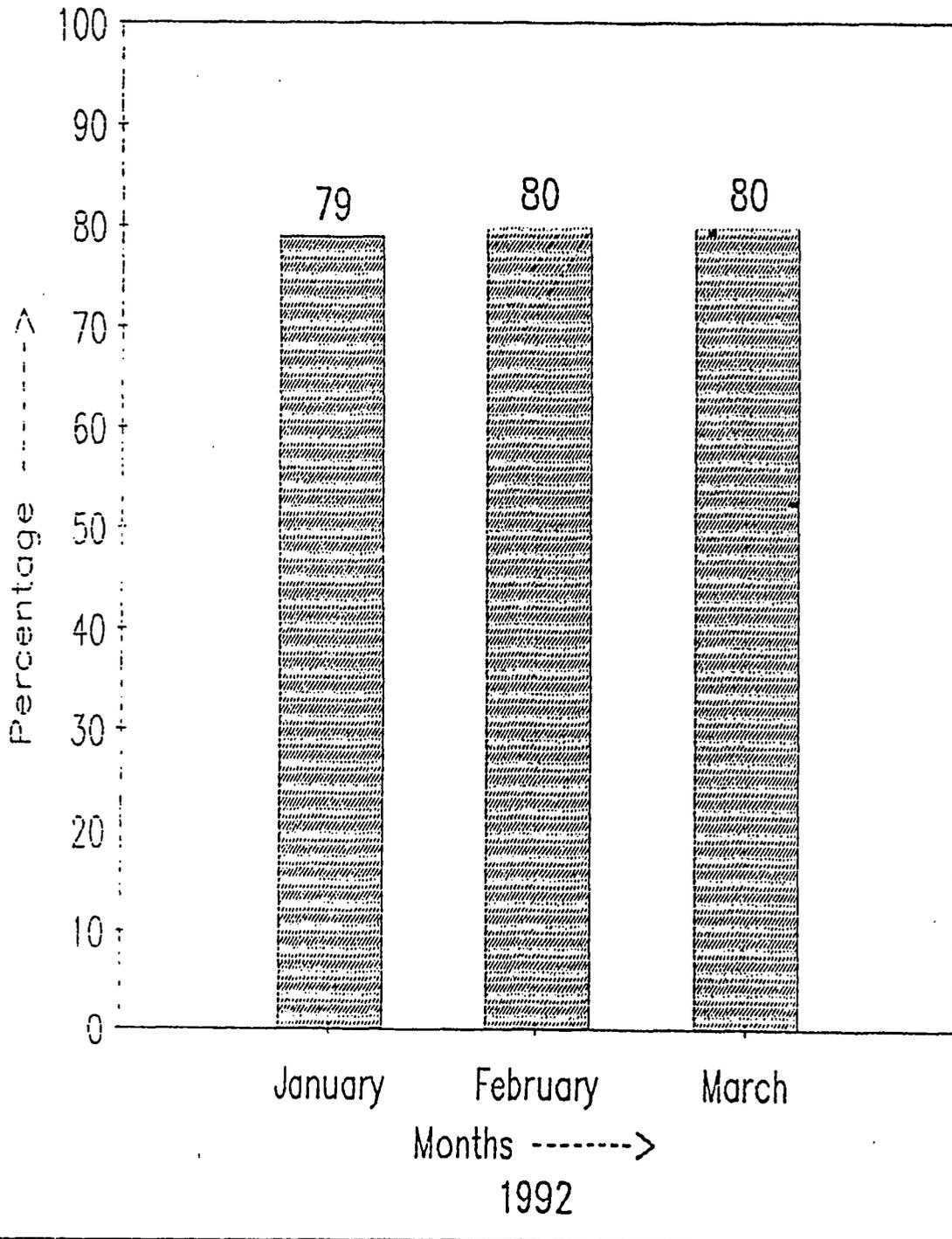
Maintenance Efficiency



238

152

IRRIGATION SYSTEMS MANAGEMENT PROJECT  
Project Level Performance  
(First Quarter - 1992)  
Paddy Production

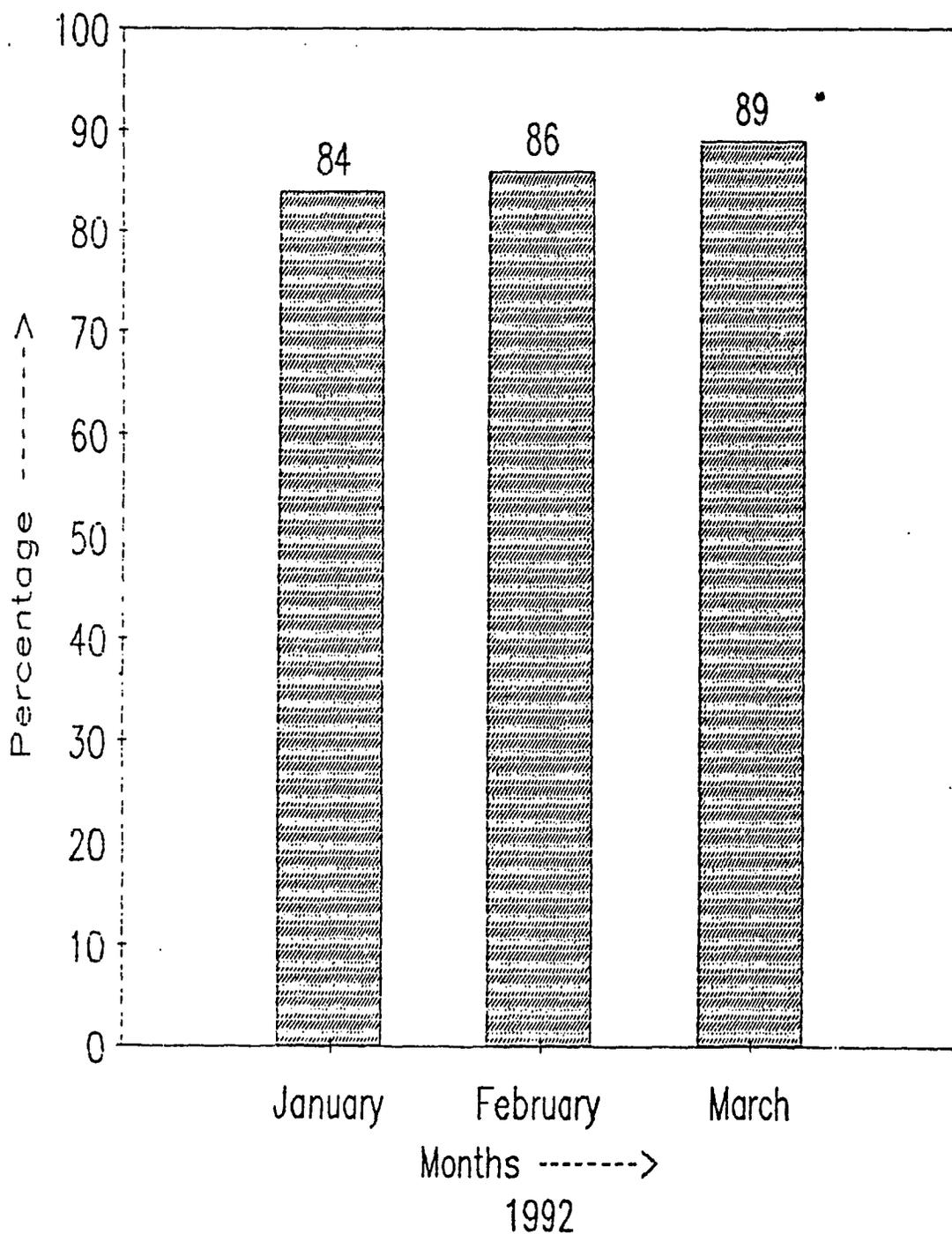


# IRRIGATION SYSTEMS MANAGEMENT PROJECT

Project Level Performance

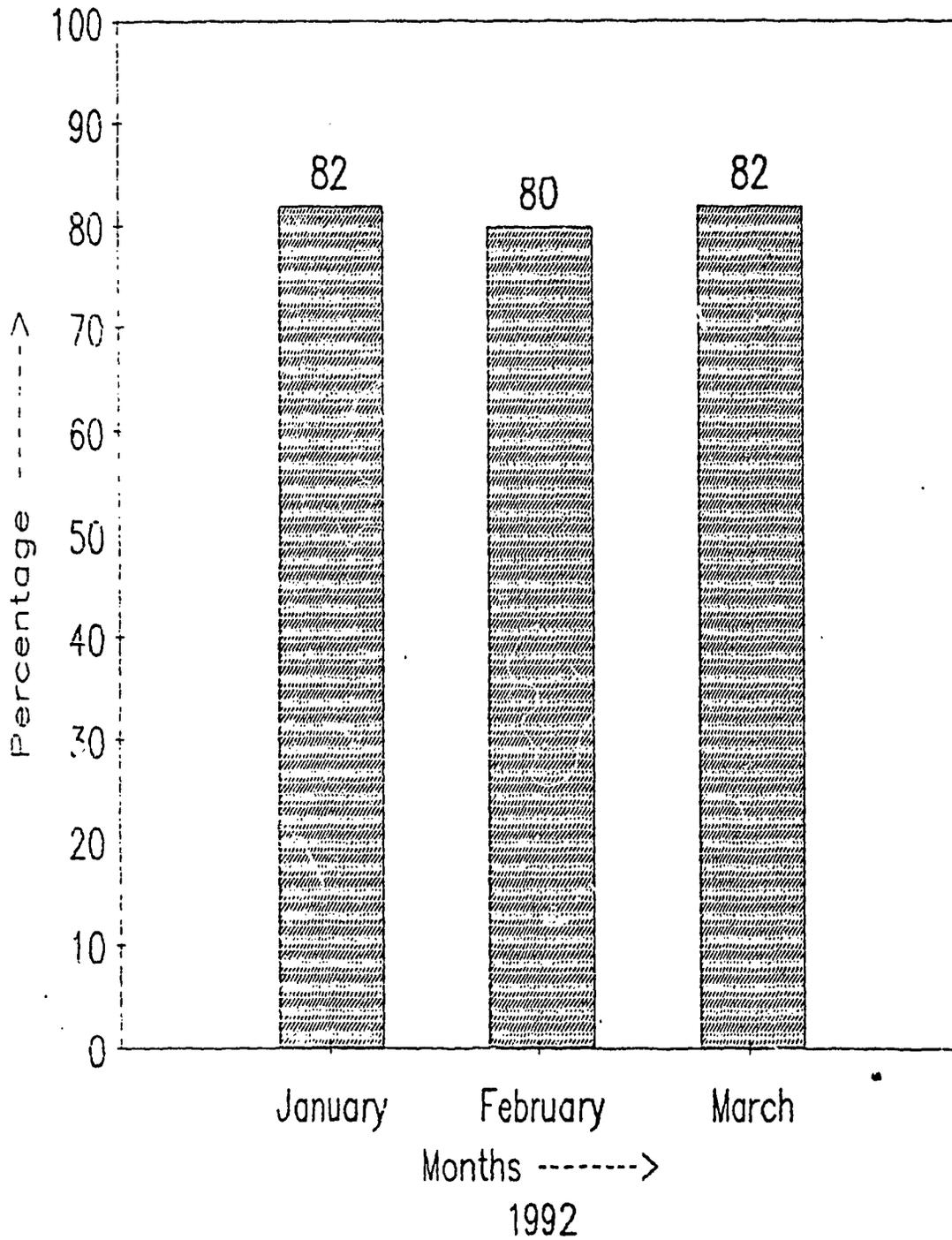
( First Quarter - 1992 )

Other Food Crops Production



# IRRIGATION SYSTEMS MANAGEMENT PROJECT

Project Level Performance  
( First Quarter - 1992 )  
Off-Farm Employment

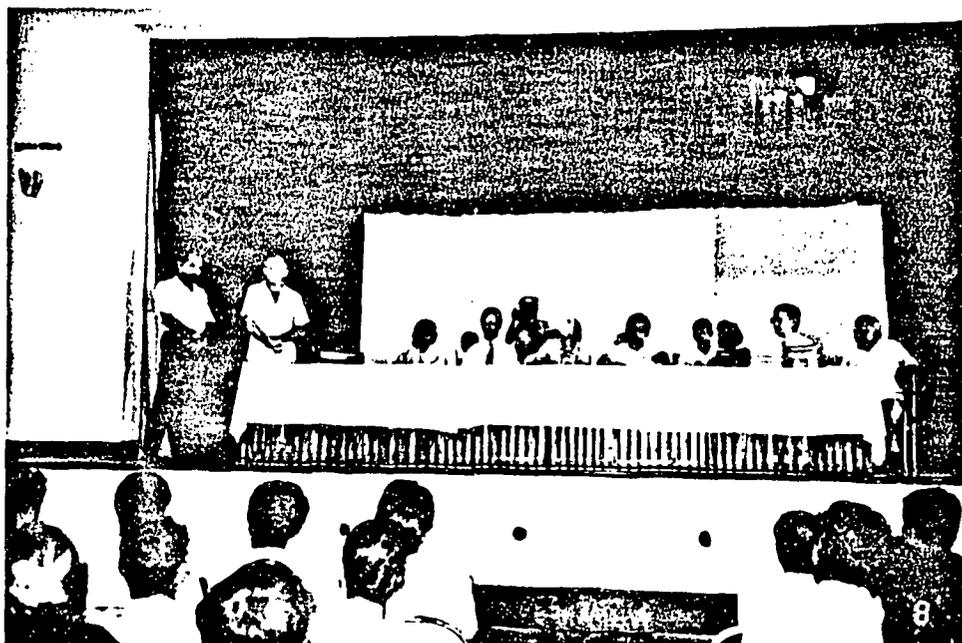


ANNEX X  
ISMP PHOTOS

Over the Life of Project many photographs have been taken of various Project Component activities. Some of these photos are presented in this Annex and cover the following six categories of ISMP efforts.

1. FARMER ORGANIZATION DEVELOPMENT
2. OPERATION AND Maintenance
3. REHABILITATION
4. TRAINING
5. CROP DIVERSIFICATION
6. VISITORS TO THE PROJECT

# 1. FARMER ORGANIZATION DEVELOPMENT



Mr. C.F. Leonhardt, Sheladia Associates Inc., Chief of Party, addressing the DCFO officers during the Handover Ceremony of D-Canals on 8 4February 1992.



The DCFO officers attending the Handover Ceremony for D-Canals by ID to the DCFOs on 8 February 1992.

1. FARMER ORGANIZATION DEVELOPMENT (Cont'd)



Women farmer organizations training program for fruit processing and preservation in Minneriya Scheme.



A group of proud women farmers with the finished products, high in quality, preserved properly and tasty.

244

1. FARMER ORGANIZATION DEVELOPMENT (Cont'd)



Women's Organization Meeting in Minneriya Scheme.



USAID Visitors to ISMP being briefed by President of Jayanthipura DCEO in Giritale Scheme.

245

1. FARMER ORGANIZATION DEVELOPMENT (Cont'd)



Women farmers in Minneriya Scheme busy making fruit jams and cordials.



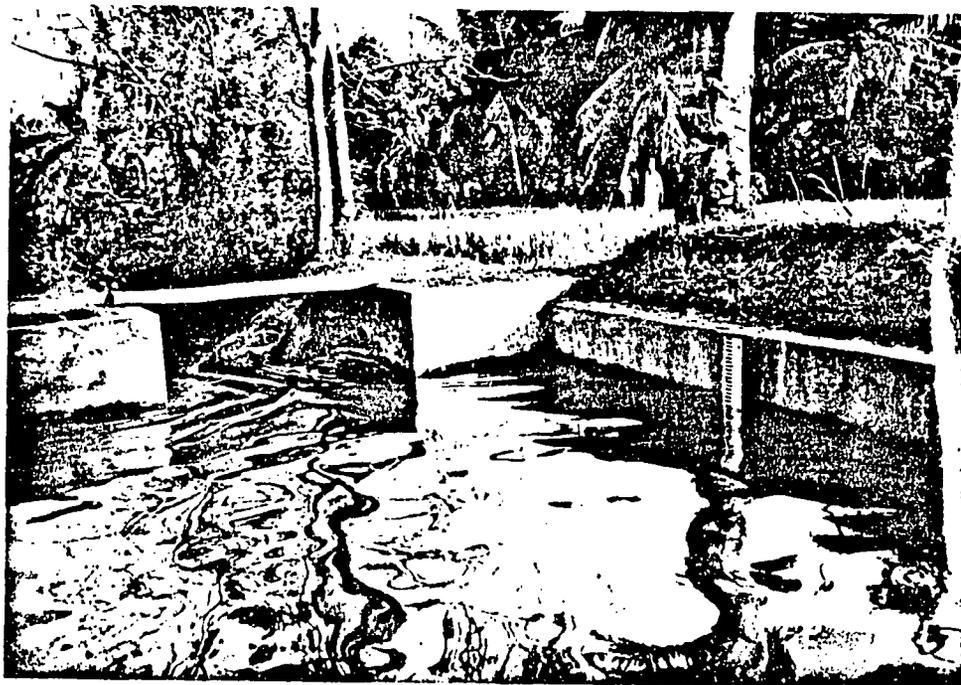
Shramadana work undertaken by members of Purana Muslim DCFO at the tail end of D-7 Canal in Giritale Scheme.

246

## 2. OPERATION AND MAINTENANCE IMPROVEMENTS



Cut throat flume installed for measuring D-24 D-Canal Giritale Scheme.

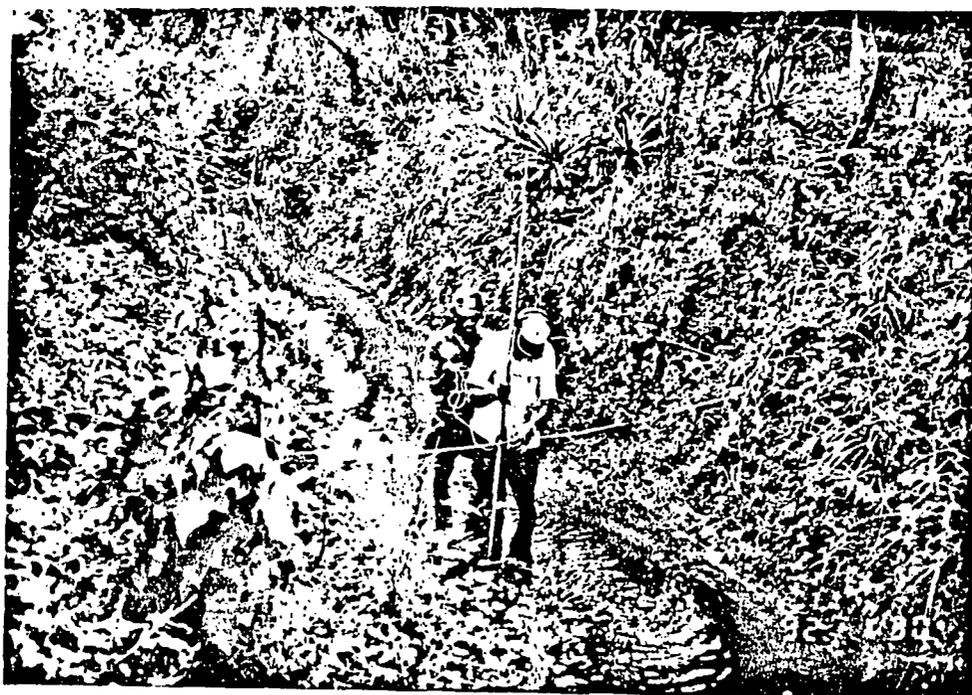


Controlled section and drop structure on D-6 Canal Giritale Scheme for Water Management.

2. OPERATION AND MAINTENANCE IMPROVEMENTS (Cont'd)

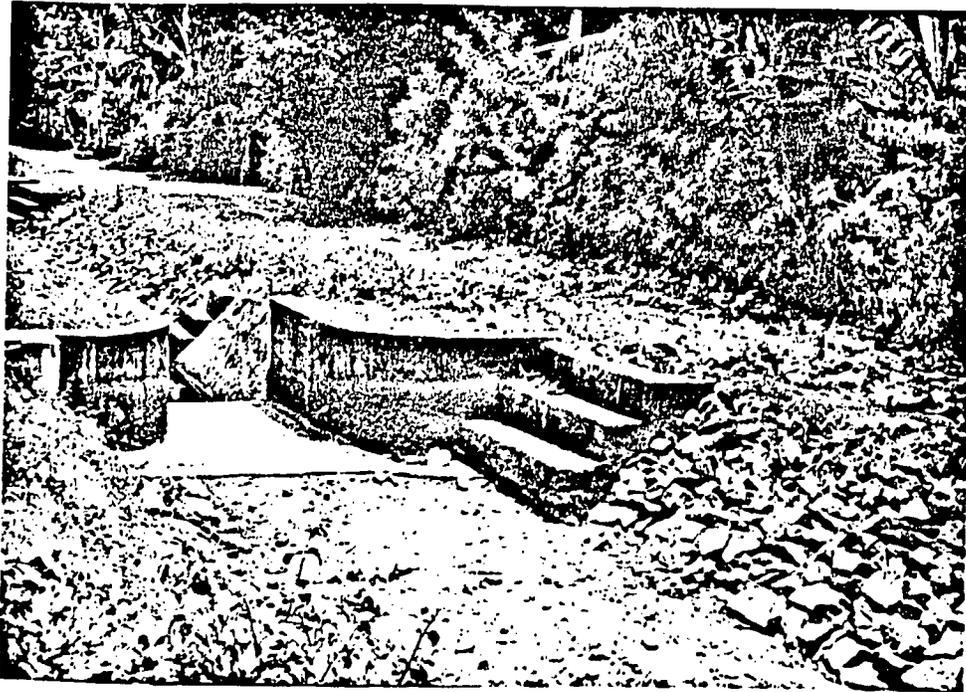


Cut throat flume constructed at RB-1 off LBMC Giritale Scheme for Water Management.



Current meter measurements on D-canal Parakrama Samudra Scheme.

### 3. REHABILITATION

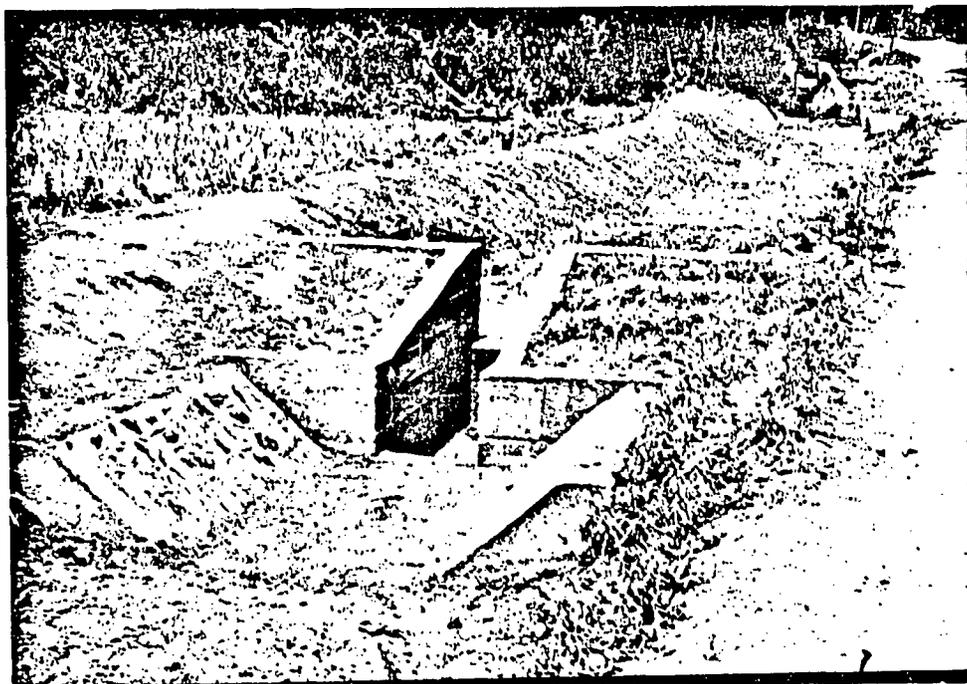


Dry rubble packing slope protection constructed upstream and downstream of existing drop structure in D-2 Main Canal-Parakrama Samudra Scheme.

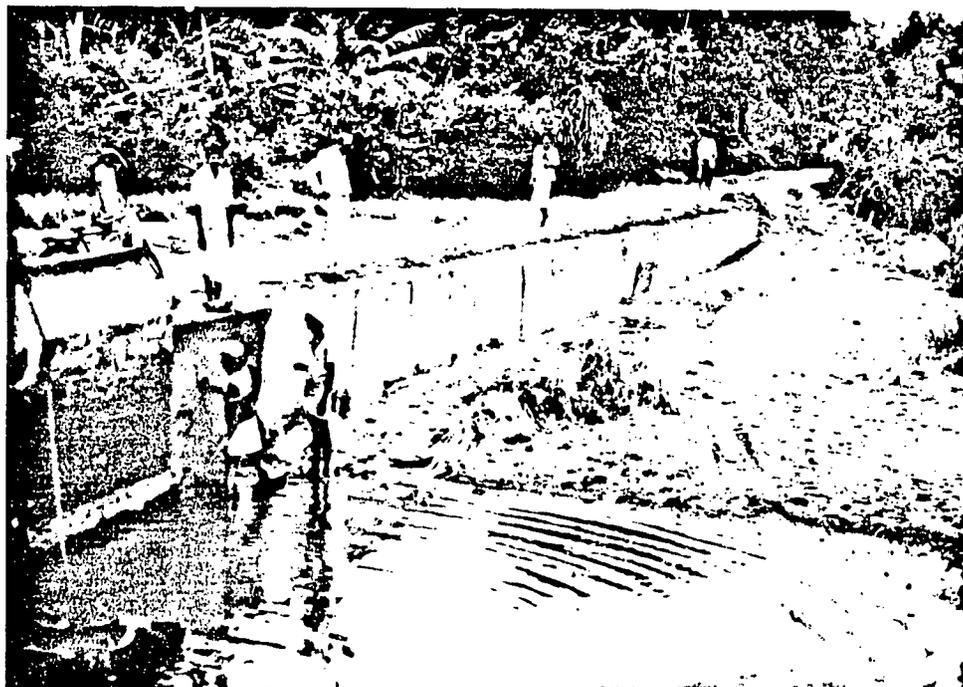


Three bay gated regulator constructed on LL Main Canal Kaudulla Scheme.

### 3. REHABILITATION (Cont'd)

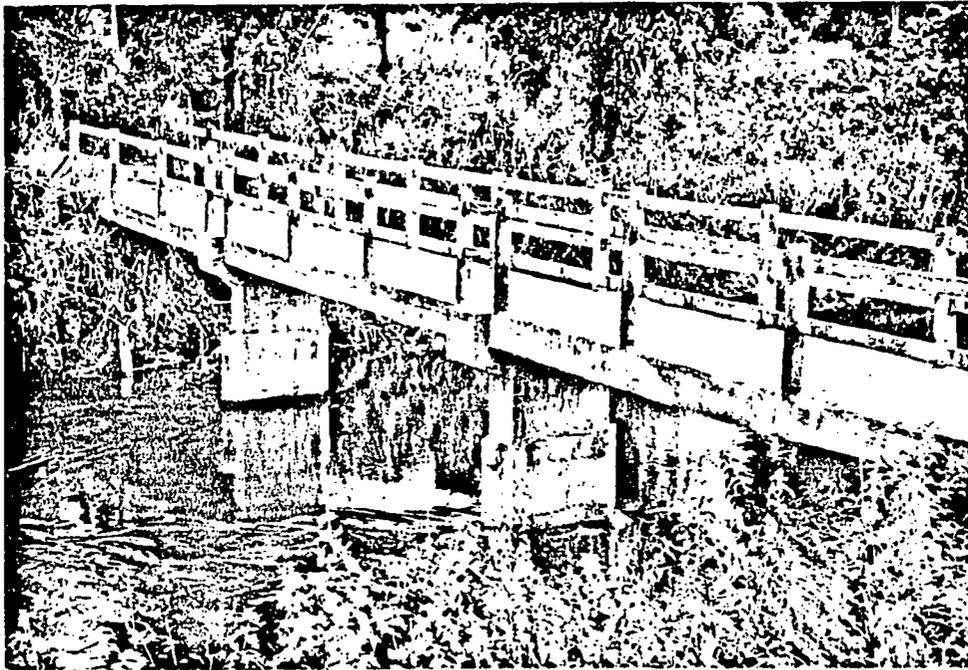


ISMP vertical drop structure constructed on D-canal Parakrama Samudra Scheme.

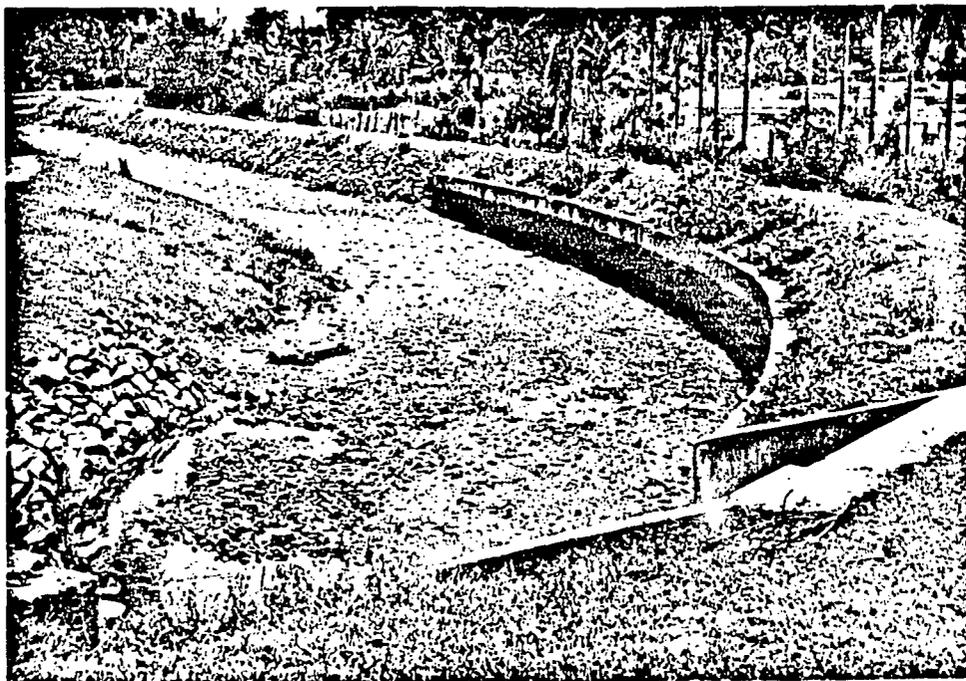


Construction of retaining walls in D-1 North canal of Parakrama Samudra Scheme.

### 3. REHABILITATION (Cont'd)

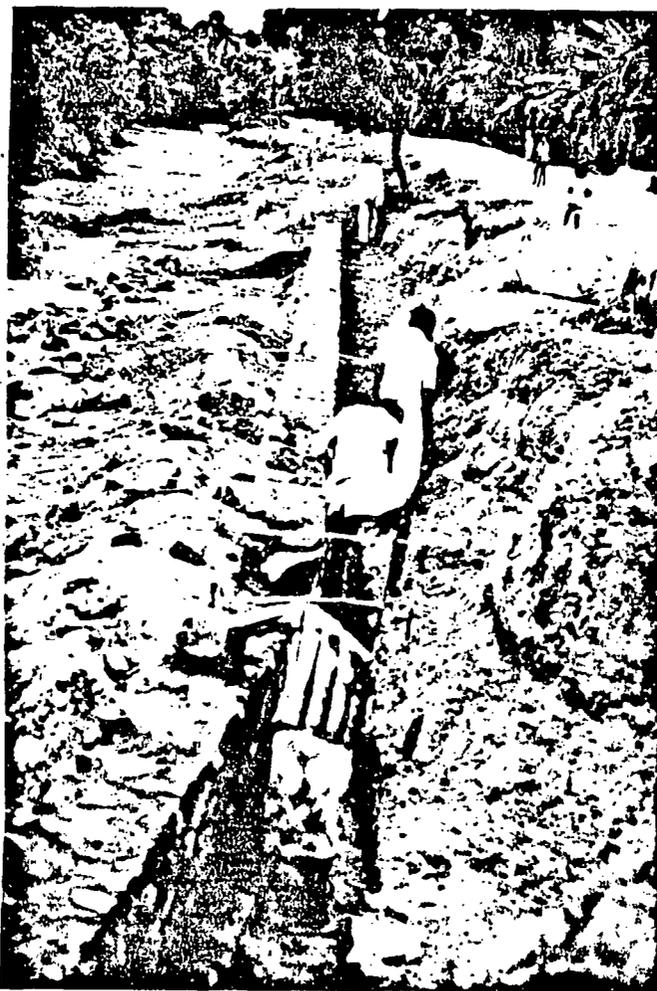


Foot bridge constructed along High Level Main Canal of Kaudulla Scheme.



Bathing steps/retaining wall and dry rubble packing along D-2 Main Canal of Parakrama Samudra Scheme.

### 3. REHABILITATION (Cont'd)



Retaining wall under construction along D-canal in Parakrama Samudra Scheme.



Dry rubble packing on LB of D-1 East canal of Parakrama Samudra Scheme.

### 3. REHABILITATION (Cont'd)

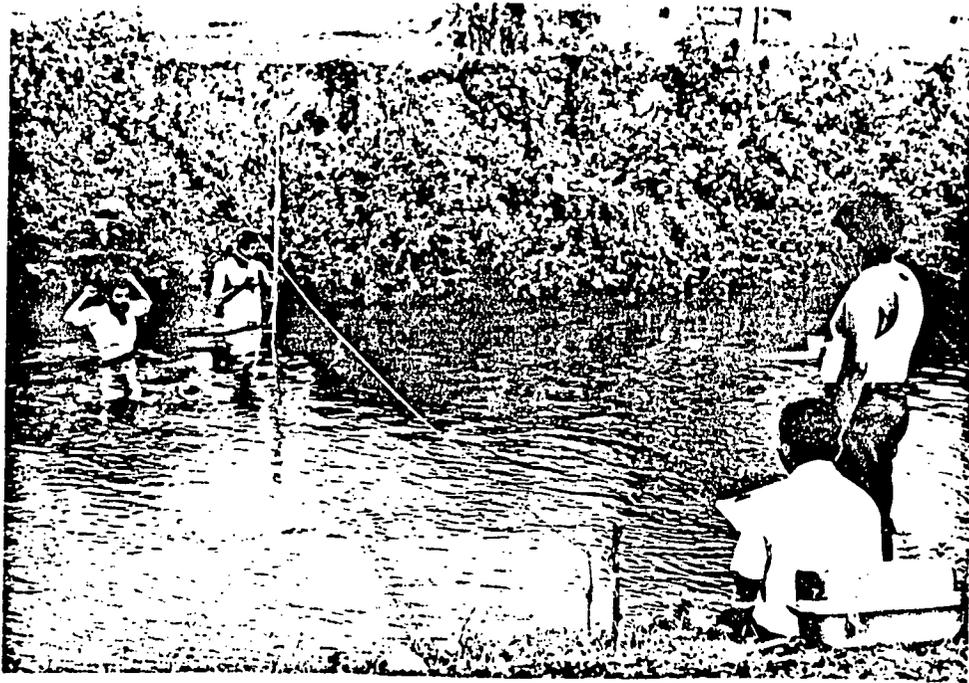


Newly constructed masonry retaining walls with new earth filling in D-6 canal, Giritale Scheme.



Newly constructed retaining wall on LB 3/D-1 East in Parakrama Samudra Scheme

#### 4. TRAINING



Water measurements training to TAs under ISMP Water Measurement Training.



In-service IO training in Minneriya Scheme.

4. TRAINING (Cont'd)



TA training to 60 TAs in Operation and Maintenance Group Picture.



Farm women busy in learning how to do fruit processing and preserving.

255

## 5. CROP DIVERSIFICATION



Field day conducted in a demonstration field, help neighbors to learn the potential to grow other crops in the paddy lands.



Demonstration of Big Onion cultivation in paddy lands is a success and cultivators can gain as high as 14 times the net income from paddy.

## 5. CROP DIVERSIFICATION (Cont'd)

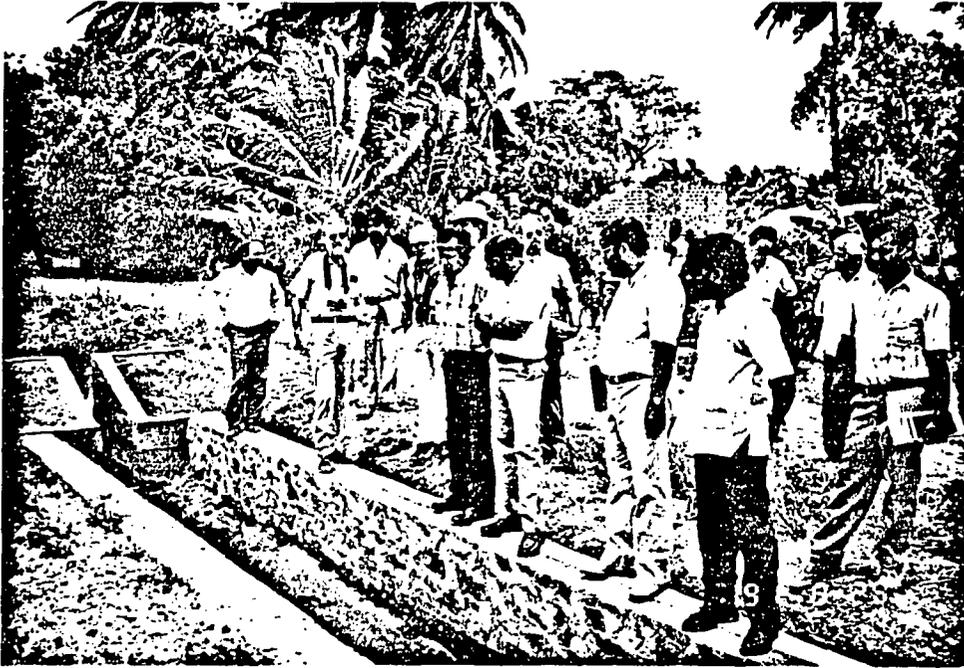


Gherkins grown in well drained paddy lands, earn net returns 3-4 times than of paddy.



Zerotillage planted mungbean yields a mean of 350 kg/ha giving a net income of Rs 4,670/ha for a 67-day crop.

## 6. VISITORS

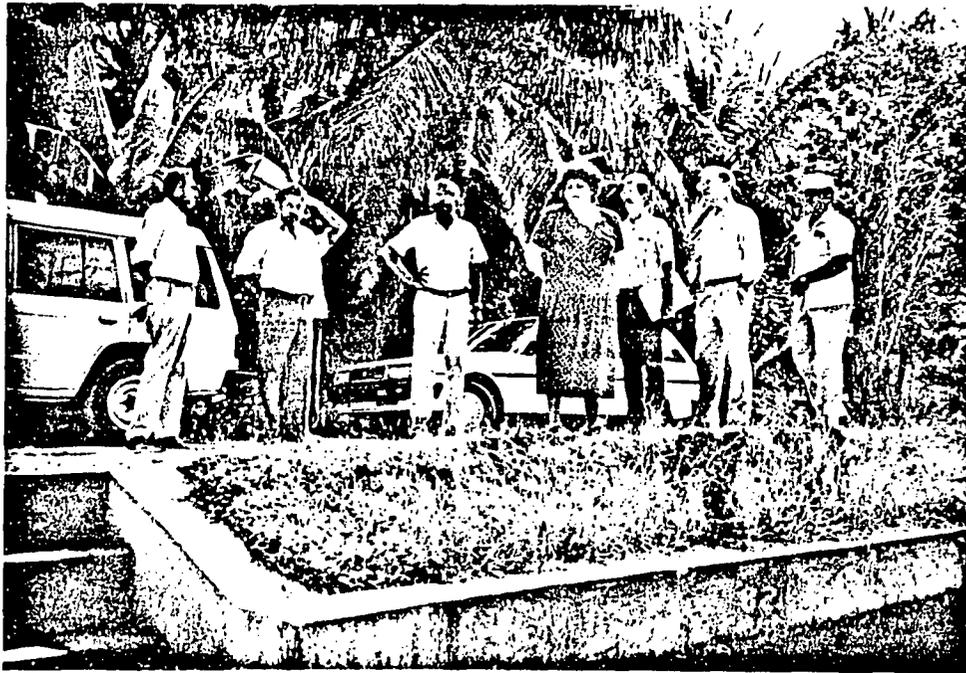


USAID visitors from Washington D.C. inspected newly constructed drop structure and downstream retaining walls in Parakrama Samudra Scheme.



USAID administrator, Dr. Roskins, addressing a Farmer Organization Development Program in Minneriya Scheme on 12 October 1991.

## 6. VISITORS (Cont'd)



Ms. Phillis Forbes, USAID Asia Coordinator for Washington D.C. visiting ISMP on April 3, 1992 to inspect completed construction work. In the picture from left to right are Mr. Piyaratne, DA; Mr. S. Seneviratne, IE; G.T. Jayawardena, Project Director; Ms. P. Forbes; Mr. Glen Anders; Mr. H.B. Bautista; Mr. George Jones; Deputy Director, USAID.



RIG Construction Auditors, visited ISMP Polonnaruwa on the 19 and 20 May 1992. In the picture from left to right are Mr. W. Amarakoon, Mr. S.Senaratna, Mr. D.Weerakoon, Mr. C.F. Leonhardt COP (SAI), Mr. Murray (RIG Const.), Mr. M.F.M. Faleel (USAID) and Miss. Miriam Huish (RIG Const).

259

6. VISITORS (Cont'd)



Ms. Audrey Lutz, Sheladia Vice President visiting the Women Farmer Organization in Minneriya Scheme.



Richard Brown, Director, USAID, President of DCFO; Mr. Wijetunge, Secretary to MLIMD; Mr. Roskin, USAID Administrator and Donald Westmore lighting the lamp at opening of Farmer Organization Development Program in Minneriya Scheme on 12 October 1991.