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International Science and Technology Institute, Inc.

P R O J E C T E V A L U A T I O N S

MAHAWELI BASIN DEVELOPMENT PROJECT PHASE I
(Project No. 383-0056 -- Mid-Term Evaluation)

MAHAWELI BASIN DEVELOPMENT PROJECT PHASE II
(Project No. 383-0073 -- Mid-Term Evaluation)

MAHAWELI SECTOR SUPPORT LOAN
(Project No. 383-0078 -- End-of-Project Evaluation)

Prepared for:

U.S. Agency for International Development
Colombo, Sri Lanka
(Contract No. PDC-0000-I-30-3083-00)

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June 1985

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One of the many demands made on those involved with the implementation of the Mahaweli Program is the need to respond to the countless requests of evaluators, not only for information, but also for more mundane logistical assistance. We were most impressed not only with the efficiency but also with the good humor of all the people who helped us with our work. We would like to express our thanks to the people whom we have listed among our contacts as well as to the numerous statistical analysts, field workers and Mahaweli settlers who gave so ungrudgingly of their time and observations.

BASIC PROJECT IDENTIFICATION DATA

1. Country: Sri Lanka
2. Project Title: Mahaweli Basin Development Phase I
3. Project Number: 383-0056 (Loan)
4. Project Dates:
 - a) First Project Agreement: June 26, 1980
 - b) Final Obligation: FY 1980
 - c) Project Activity Completion Date (PACD): September 30, 1986
5. Project Funding:
 - a) AID Bilateral Funding (Loan): \$10,000 million
 - b) Other Major Donors: None
 - c) Host Country Counterpart Funds: \$4,196 million
\$14,196 million
6. Mode of Implementation: Host country contract between Government of Sri Lanka and Berger/IECO
7. Project Design: The Government of Sri Lanka
USAID/Colombo
CH2M Hill
8. Responsible Mission Officials:
 - a) Mission Director: Sara Jane Littlefield, 1979-1984
Frank D. Correl, 1984-Present
 - b) Project Officers: Gilbert N. Haycock, 1979-Present
9. Previous Evaluations: None
10. Cost of Present Evaluation: (combined evaluation of Mahaweli Phase I (383-0056), Phase II (383-0073) and Sector Support (383-0078))
 - a) Direct Hire: None
 - b) Contract: \$95,440

BASIC PROJECT IDENTIFICATION DATA

1. Country : Sri Lanka
2. Project Title : Mahaweli Basin Development Phase II
3. Project Number : 383-0073 (Loan and Grant)
4. Project Dates:
 - a) First Project Agreement : May 29, 1981
 - b) Final Obligation : FY 1985
 - c) Project Activity Completion Date : September 30, 1986
5. Project Funding:
 - a) AID Bilateral Funding (Loan) : 107.000 million
(Grant) : 3.000 million
 - b) Other Major Donors : 71.000 million
 - c) Host Country Couterpart Funds : 65.999 million
Total \$250,999 million
6. Mode of Implementation: Host Country Contract between the Government of Sri Lanka (GSL) and Zachry/Dillingham Joint Venture
7. Project Design : The Government of Sri Lanka
USAID/Colombo
CH2M Hill
8. Responsible Mission Officials:
 - a) Mission Directors: Sara Jane Littlefield, 1979 to 1984
Frank D. Correl, 1984 to present
 - b) Project Officers : Gilbert N. Haycock, 1980 to present
9. Previous Evaluations : July, 1983
10. Cost of present Evaluation: Combined Evaluation of Mahaweli Phase I (383-0056), Phase II (383-0073) and Sector Support (383-0078)
 - a) Direct Hire: None
 - b) Contract : \$95,440

BASIC PROJECT IDENTIFICATION DATA

1. Country : Sri Lanka
2. Project Title : Mahaweli Sector Support
3. Project Number ; 383-0078 (Loan)
4. Project Dates:
 - a) First Project Agreement: May 29, 1981
 - b) Final Obligation : FY 1983
 - c) Project Activity Completion Date (PACD): June 30, 1985
5. Project Funding:
 - a) AID Bilateral Funding (Loan): \$50 Million
 - b) Other major donors : None
 - c) Host Country Counterpart Funds: None

Total \$50 Million
6. Mode of Implementation: Program Assistance, Government of Sri Lanka and USAID/Colombo
7. Project Design: PSC \$16,832
8. Responsible Mission Officials:
 - a) Mission Directors: Sara Jane Littlefield, 1979 - 1984
Frank D. Correl, 1984-present
 - b) Project Officers: Jeff Evans, 1980-1982
Gilbert N. Haycock, 1982-1984
Leroy Purifoy, 1985-Present
9. Previous Evaluations: None
10. Cost of Present Evaluations: (Combined evaluations of Mahaweli Phase I (383-0056), Phase II (383-0073) and Sector Support (383-0078))
 - a) Direct Hire: None
 - b) Contract : \$95,440

EXECUTIVE SUMMARY

A. Problem and Overview

In 1977 the Government of Sri Lanka decided to accelerate development of the resources of the country's major river, the Mahaweli Ganga, to bring land in the dry zone of the country under irrigated production on small farms owned by voluntary settlers. The program, which has been designated the Accelerated Mahaweli Program (AMP) has the main objectives of generating electric power, settling poor, landless and displaced populations, promoting self-sufficiency in food production, increasing employment and incomes, and regional development.

B. U.S. Assistance

- Mahaweli Basin Development Phase I (No. 383-0056) (PACD Sept. 30, 1986) is being implemented in System B of the AMP. System B has a total area of approximately 130,000 ha. of which 52,000 ha. have been considered suitable for agriculture. The project is financing technical assistance and related training and equipment primarily for the design and supervision of construction of main and branch canals and the design of the main drainage system on the Left Bank of the system. It also includes the design of distributaries and on-farm works for sample areas totalling 4,000 ha. and technical assistance for the design and supervision of System B's tertiary irrigation and drainage system. Loan funds of \$400,000 have also been made available to finance goods, services and training to help mitigate possible negative environmental impacts of the project, particularly on wildlife.

- Mahaweli Basin Development Phase II (No. 383-0073) (PACD Sept. 30, 1986) is being implemented on the Left Bank of System B, which has a total area of 75,000 ha. The USAID loan is financing the foreign exchange costs of construction of 52.9 km of concrete lined main canals and 86.6 km of concrete lined branch canals providing a main and branch water delivery system to irrigate an area of 21,800 ha. The loan also provides for payment of foreign exchange costs for procuring miscellaneous equipment.

- Mahaweli Sector Support Loan (No. 383-0078) (PACD June 30, 1985) provides local currency budget support for selected downstream activities of the AMP in Systems H, C, B and G. Actual expenditures incurred by the Mahaweli Authority of Sri Lanka for these activities were reimbursed and local currency funds were generated by financing imports from the United States on the basis of Unrestricted Special Letters of Credit.

C. Purpose of Evaluation

This evaluation has been a combined review of three USAID financed projects in the Mahaweli Basin. The overlap in the activities, program purposes and goals of the three projects has made it most appropriate to make a single integrated presentation of the evaluation results. Since agricultural and socio-economic development issues loom large in the development of the downstream AMP this evaluation extends beyond the design and construction directly financed with U.S. funds to focus more heavily than might otherwise be the case on the effectiveness of the general operation of the Mahaweli Authority of Sri Lanka and its subsidiary organisations.

The evaluation team was asked to examine Systems H, C and B to evaluate the impact of the MSS and to assess the development of System B in comparison with the experiences in systems where settlement has progressed further.

D. Findings

1. Implementation Progress and Financing for USAID-assisted Design and Construction of Main and Branch Canals in System B

Construction progress for the main and branch canals under the revised schedule of work are presently on target, with planned schedule of completion by January 1987. Adequate funds are available in the loans to complete the work under the present schedule. However, claim and arbitration actions recently initiated by the contractor, resulting from civil strife, may result in subsequent financial awards exceeding the funds available under the loan.

2. Implementation Progress and Financing for Downstream Development in System B

The downstream infrastructure development being financed and implemented by the GSL (with MSS as one source of funds) is short of planned completion targets with logistics, rather than funds, being the main constraint to date. It is not expected that downstream canal distribution and drainage channels will be in place at the time of completion of the main and branch canal.

Barring unforeseen circumstances, funding will continue to be available to complete Zones 1 through 4A of System B (LB), although the pace may have to be adjusted to ensure good quality of work and an early initiation of appropriate maintenance activities. The importance of establishing a socially and politically acceptable settler recruitment policy prior to introducing large numbers of new arrivals and the need to review appropriate development approaches on the more marginal soils of System B also suggest the need to adjust the anticipated rate of development in the area.

The TA contract for developing and implementing an operations and maintenance program for the Left Bank has been executed and the U.S. contractor is mobilizing. Funds are available under the loan for procurement of maintenance equipment.

3. Effectiveness of USAID Contributions in Assisting GSL to Meet Project Goals in Systems H, C and B

Production: In Maha '84/'85 less than 20% of the irrigable paddy area in the newly settled Zones 1 and 5 of System B was cultivated and less than 10% was irrigated. Consequently the contribution to increased production has still been minimal. However, given that development in all three systems involves the intensification of agricultural production, it can be anticipated that they will contribute to increased absolute levels of food output for the country.

Improved Income and Employment Generation: There has been a transfer of land assets to the previously land poor but it is questionable whether, so far, the majority of settlers have been able to earn more than a subsistence income as a result. World Food Program aid and, possibly to a lesser extent, construction work have helped to provide a temporary safety net, but experience in Systems C and H indicate that the future achievement of production, income and employment objectives require

immediate remedial action in the fields of water management and O/M, extension training for women, farmer managed storage and marketing, farm product pricing and import policy, and credit administration and interest rates. Special attention should be given to a study of the causes and consequences of illegal land leasing with a view to ensuring that land tenure policies protect the weak while not creating undesirable rigidities in land allocation and land use.

Settlement and Settler Services: Settlement and settler services are generally well considered but delays in staffing, especially of schools and health services, the need for improved administration and supervision of health service staff, and inadequate water and sanitation facilities, may be contributing to hardship and ill health in the first years of settlement. Experiences in other systems suggest the need to reconsider the approach to settler house construction, and the development of an improved design for the "temporary" structure.

4. Appropriateness of the Mahaweli Sector Support (MSS) Loan

The Sector Support Loan has played a major role in permitting increased MASL operational budget levels for AMP downstream activities, compared with the levels contemplated in the 5 year investment plan and in the Finance Ministry's budget. The availability of non-inflationary financing made these increases possible. The loan would have had a greater impact on increasing U.S. exports if more information had been made available to GSL on U.S. products and marketing procedures.

The rate of reimbursement under the loan was slowed down initially by a combination of factors, most of which are remediable:

- Failure by the Mission to promptly establish accounting and reporting procedures;
- Inadequate communication between Mission and GSL on procedures;
- Lead time required by MASL to establish and break in new procedures;
- Eligibility rules established by the Mission which sharply curtailed the scope for reimbursements;
- Dollar reimbursement was delayed by the Mission decision to pre-audit GSL reimbursement requests prior to requesting opening of Letters of Credit.

Adjustment could have been made in connection with subsequent payments if necessary.

The identification, planning and budgeting of downstream infrastructure activities was adequate in scope and purpose. However, the effective implementation of planned activities fell short of targets. The overall quality of work performed was variable and there were instances of non-enforcement of construction specifications. Follow-on maintenance programs have a low priority in project budgets and the scope and implementation of activities are not achieving the desired results.

E. Recommendations

Detailed recommendations are included in Chapter 1 of this report. The recommendations cover the following general measures.

1. Additional U.S. assistance is highly desirable but should be redirected to the consolidation of already settled areas.
2. The Mission needs to organise its own efforts to assure that agricultural expertise is a major part of what is, above all, an agricultural project.
3. The MASL and the Mission should develop a revised work program for the completion of System B with revised time-phased cost estimates and financing plan. Settlers should be brought into the System at a more measured pace.
4. The MASL and the Mission should consider whether the O & M technical assistance contract under Phase II can be used effectively to strengthen the Planning, Budgeting and Reporting system in MASL to make it more action and decision oriented. It may be desirable to make the reorganisation of PMU, to strengthen its planning capability, part of this effort.
5. MASL should take immediate steps to fill the positions requested by Berger/IECO to assist with claim and arbitration issues.
6. Extension activities should be strengthened in the areas of farm and money management, extension training for women, and water and soil management.

7. There should be an increased effort to promote agricultural producers' organisations for improved storage and marketing in the Mahaweli area.
8. Banks should be allowed to charge an economic rate of interest (estimated at 25% per annum) for agricultural loans to allow the financing of better loan supervision and administration.
9. The PMU should commission policy-oriented studies regarding costs and returns to production in Mahaweli and the causes and consequences of land leasing.
10. MEA should meet with the Ministry of Health to agree on concrete measures for improved collaboration regarding the hand-over of buildings, administration and supervision of health-related staff, promotion of water and sanitation facilities, and the design of a prototype for healthier "temporary" settler housing.
11. The Mission should support IBRD recommendations which call for a sustained level of program (including food) ~~aid as an important element of the effort to assist Sri Lanka, in view of budget and foreign exchange pressures.~~ The policy framework for such aid needs careful attention. Mission management of these programs could be improved by involving more closely program, economic and controller staffs in the design and management of these programs. The pricing of ~~commodities into the economy, particularly food, needs to be watched closely.~~

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ACRONYMS, ABBREVIATIONS AND DEFINITIONS

ADB	Asian Development Bank
"Advanced Alienation"	A plan whereby settlers are brought to the project area to work as paid laborers on construction of canals, roads and other structures prior to their actual settlement with their families.
AID	Agency for International Development, an agency of the U.S. Government
AMP	Accelerated Mahaweli Program
"The Authority"	The Mahaweli Authority of Sri Lanka.
B	System B of the Mahaweli Basin
Berger/IECO	Contractors for design and supervision of main and branch canals of System B (Mahaweli Phase I)
B/I	Berger/International Engineering Co. Group
B/I CM	Berger/International Engr. Co. Construction Manager at Construction Site
BOQ	Bill of Quantities
C	System C of Mahaweli Basin
CDO	Community Development Officer (MEA)
CECB	Central Engineering and Construction Board

CH2M HILL	Contractors for O&M technical assistance grant within Mahaweli Phase II
CIP	Commercial Import Program
D	Distribution Canals
DDD	Draft and Dairy Development Program
DOH	Department of Highways
"Downstream"	Infrastructure and settlement activities being implemented downstream of the main hydro electric and irrigation headworks.
DRE	Divisional Resident Engineer/MECA, Project level
DRPM	Deputy Resident Project Manager/MEA, Project level
EA	Engineering Assistant, Divisional level
EEC	European Economic Community
Electoral Selectees	See: Selectees from Electorates
Encroachers	Occupants and/or cultivators of land (usually Crown land) for which they have no legal title. Encroachment has been a common practice among chena (slash-and-burn) cultivators in the Dry Zone.
Evacuees	People settled in the AMP areas after having been displaced from their homes as a result of upstream development, mostly, though not entirely, in the Victoria and Kotmale Dam areas.
F	Field Canals or channels

F.Y.	Fiscal Year
FX	Foreign Exchange
GSL	Government of Sri Lanka
H	System H of Mahaweli Basin; includes three projects: Galnewa, Thambuttegama (H4), and Nochchiyagama (H5).
ha.	hectares
"Homestead" Plot	<p>An unirrigated settlement plot located in a hamlet or village cluster, where settlers are to build their homes and may establish home gardens and small livestock enterprises; plots of .5 acres (1 acre in parts of System C) are alienated to each eligible settler.</p> <p>A proportion of settlers in each project area (roughly 20%) are alienated only homestead plots which are not associated with a paddy plot.</p>
Hq.	Headquarters
IBRD	International Bank for Reconstruction and Development - World Bank
IDA	International Development Association - part of the World Bank Group
IE	Irrigation Engineer, MEA Block level
IRR	Internal Rate of Return
Km.	Kilometer
L/C	Letter of Credit

Maha Season	Cultivation season generally lasting from November through February. In the AMP area this is a time of monsoonal rains.
MASL	Mahaweli Authority of Sri Lanka
MEA	Mahaweli Economic Authority
MECA	Mahaweli Engineering and Construction Authority
MOH	Ministry of Health
MSS	Mahaweli Sector Support Loan (No. 383 - 0078)
MWRD	Mahaweli and Water Resources Division/USAID/Colombo
O/M	Operation and Maintenance, MEA, Project level
OPEC	Organization of Petroleum Exporting Countries
"Paddy" Plot	An irrigated settlement plot which is presumed to be suitable for lowland paddy cultivation; plots (usually only one, but more in some cases) of 2.5 acres of paddy land are alienated to each eligible settler.
Phase 1 (a)	Main and Branch Canal Construction in System B, Zones 1 and 5, Left Bank
Phase 1 (b)	Main and Branch Canal Construction, in System B, Zones 2, 3, 4A, Left Bank
Phase I	AID Loan, Phase I, Design and Construction Supervision (No. 383-0056)
Phase II	AID Loan, Phase II, Construction Services (No. 383-0073)

PIP	Public Investment Plan of the Government of Sri Lanka.
PMB	Paddy Marketing Board
PMU	Planning and Monitoring Unit of the Mahaweli Authority of Sri Lanka
PP	Project Paper
Purana Village	An existing or traditional village
RDC	Resources Development Consultants; a Sri Lankan technical firm
Resettlers	People previously living in the areas being developed under the AMP. This includes primarily "old" (purana) villagers and "encroachers" who have moved into the area to cultivate crown land.
RPD	Resident Project Director/MECA, Project level
RPE	Resident Project Engineer, Divisional level
RPM	Resident Project Manager / MEA, Project level
RVDB	River Valley Development Board
SDCC	State Development Construction Corporation
Selectees from Electorates	People specially selected for settlement in the AMP areas by Land Kachcheris in accordance with predetermined guidelines.
Settler	The individual to whom an AMP plot is alienated. For planning purposes it is assumed that every settler is a member of a family of five.

SSC	Small Scale Contracts
System B (LB)	System B, Left Bank (of the Maluru Oya) of the Accelerated Mahaweli Program
TAMS	Tippetts - Abbett - McCarthy - Stratton. Contractors for the environmental assessment of the AMP completed with U.S. funding in 1979/80.
TO or TA	Technical Officer or Assistant, Divisional level
Turnout	The lowest level of water distribution within an irrigation system. Turnouts are located along either side of field canals, a number of which are fed by a distributory canal or branch canal.
Turnout Groups	A farmers' water management association based on the turnout.
UK	United Kingdom of Great Britain and Northern Ireland
U.S.	United States of America
USAID	United States Agency for International Development/Colombo Sri Lanka
USLC	Unrestricted Special Letter of Credit
Vedda	A tribal group ^{of} hunters and gatherers reputed to be descended from the pre-Sinhalese aboriginal inhabitants of Sri Lanka.
WFP	World Food Program
Yala Season	Cultivation season lasting from May to September - a very dry period in the AMP area.

Z/D

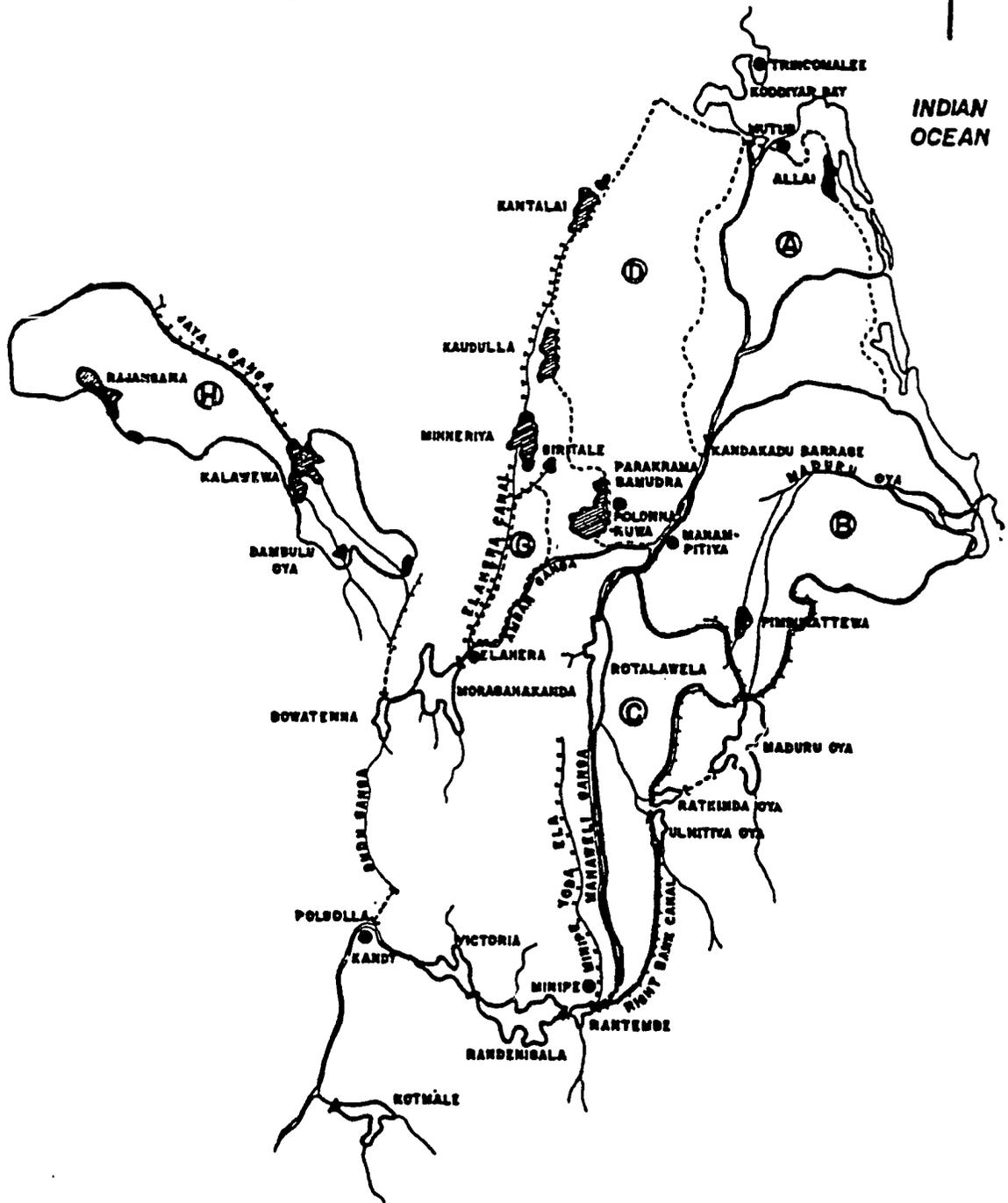
Zachry/Dillingham, Contractor for main and
branch canal construction of Phase II

MAP 1

ACCELERATED MAHAWELI DEVELOPMENT PROGRAMME



INDIAN OCEAN

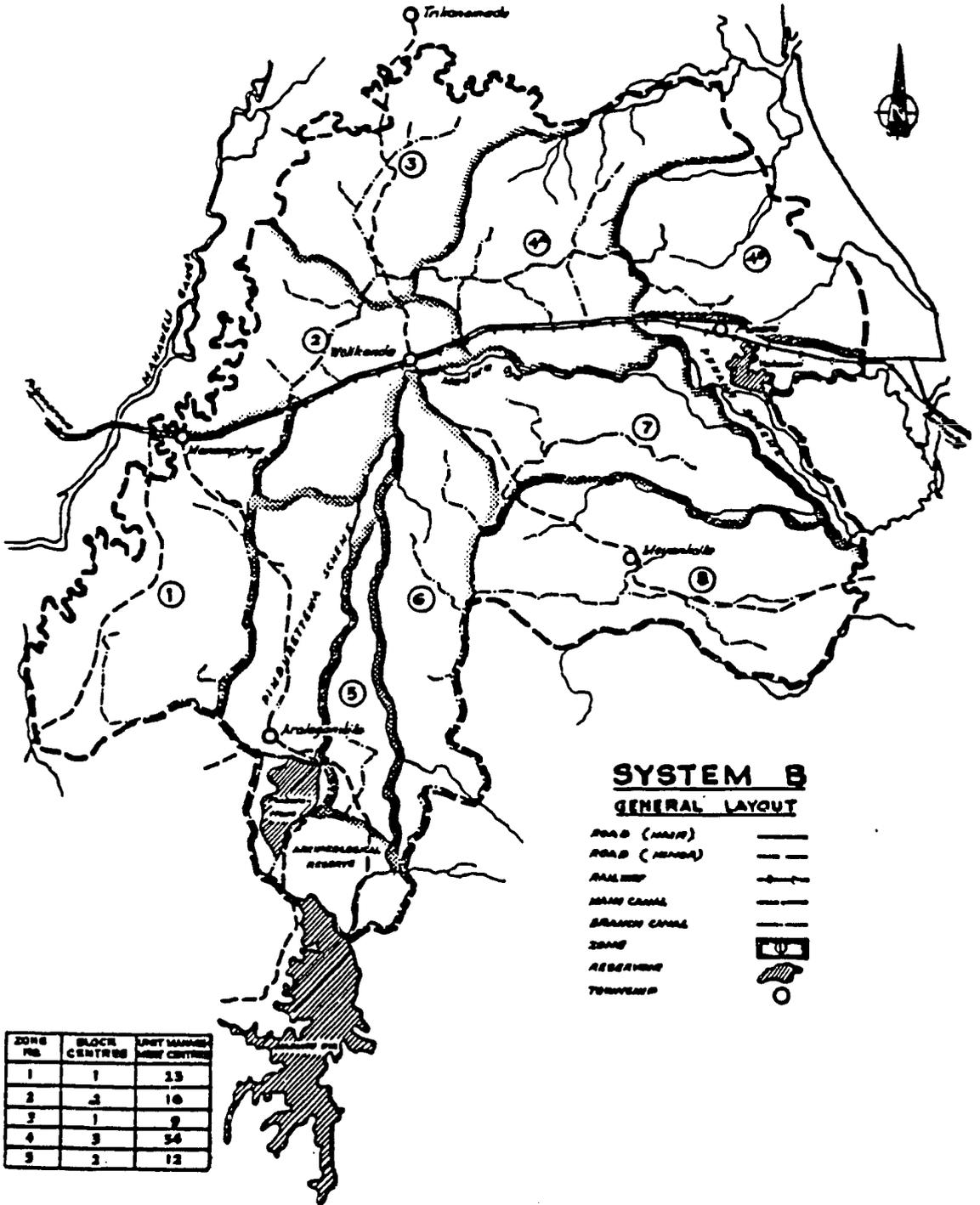


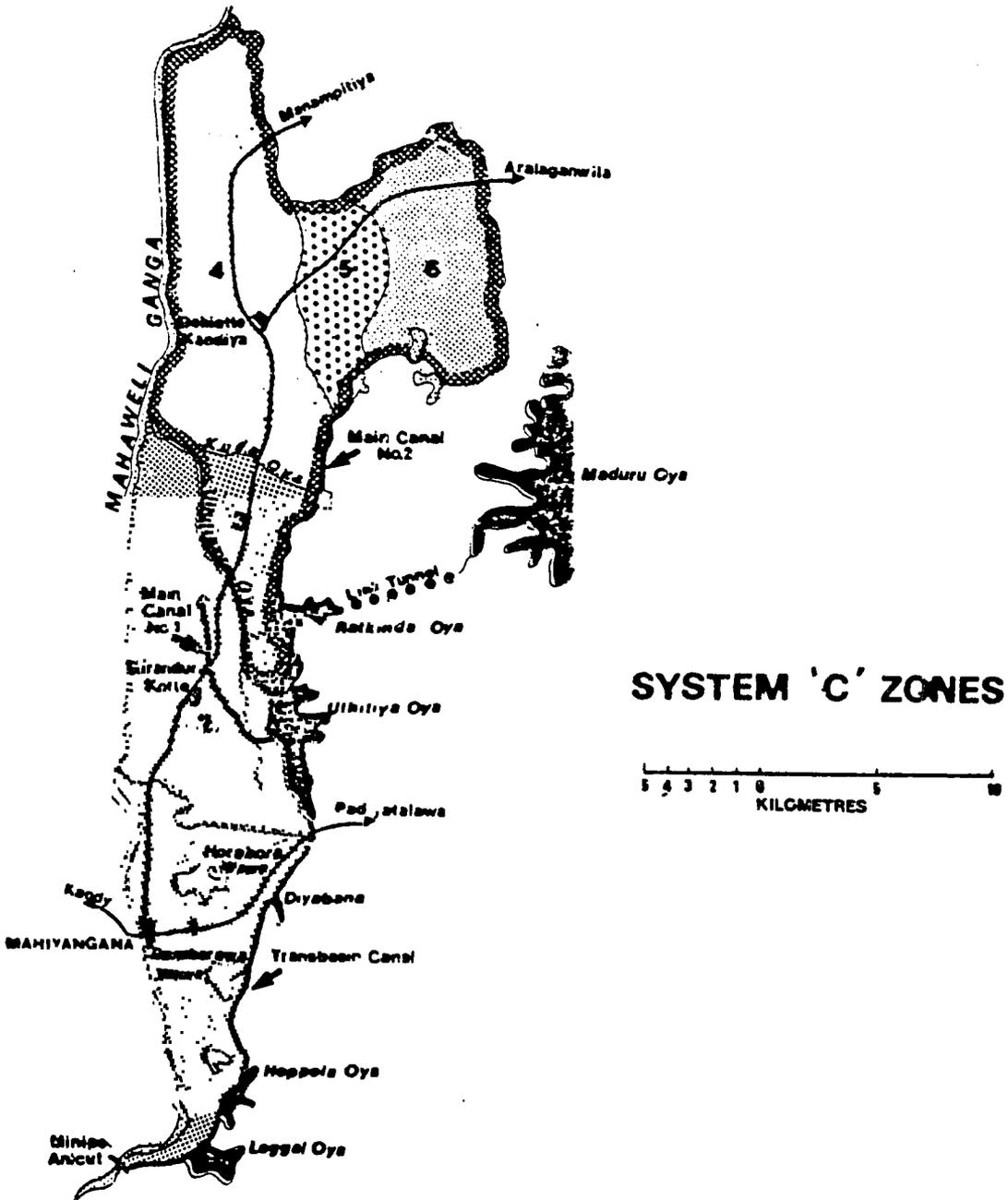
LEGEND	
EXISTING RESERVOIRS	
PROPOSED RESERVOIRS	
EXISTING CHANNELS	
PROPOSED CHANNELS	
TUNNELS	
SYSTEM BOUNDARIES	



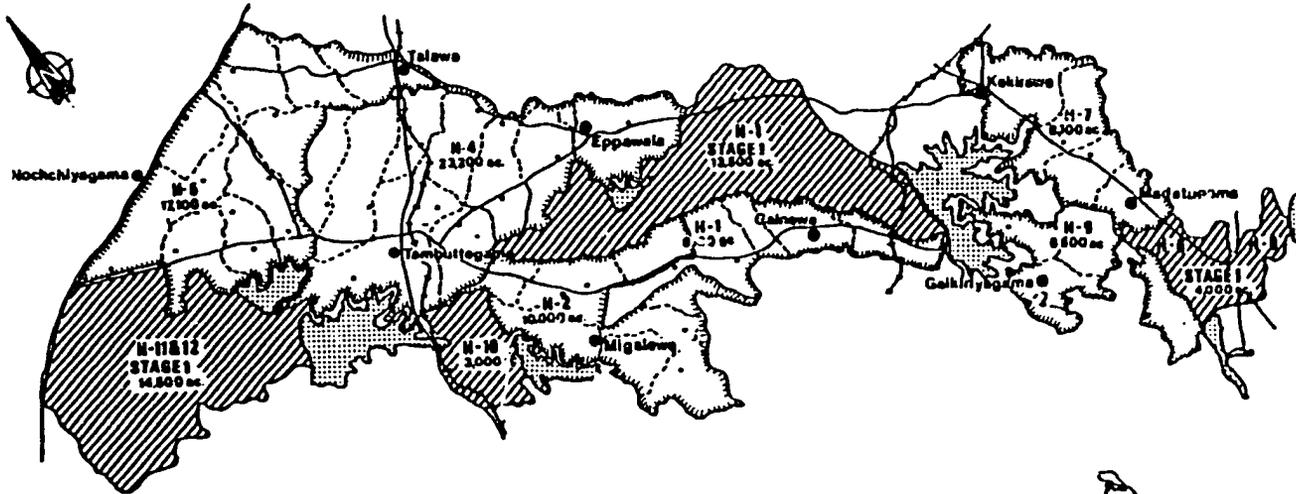
LOCATION MAP

MAP 2





SYSTEM H-GENERAL LAYOUT



TTTAXX

SCALE : 1 : 264,000

LEGEND

- Block Boundary** ---
- System Boundary** - - - -
- Main Road** ———
- Railway** —+—+—+—
- Township** ● GALNEWA
- Village Centres** •
- Main Reservoirs** ☞

PROJECT COMPONENT	Acres
Irrigation and road infrastructure	40,300
Social infrastructure	84,980
Farm equipment	71,000
Agricultural extension	108,000



1. CONCLUSIONS AND RECOMMENDATIONS

1.1 Problem and Overview

The Accelerated Mahaweli Program (AMP) is one of the three cornerstones of the strategy adopted by the UNP Government, which was elected in 1977, to address the problem of slow growth in agriculture and industry, unemployment and balance of payment problems associated with stagnant exports and large food import bills. The AMP was originally proposed in 1979 as a five year program estimated to cost 38 billion rupees. It is now expected to be completed by 1988/89 and most recent estimates made in 1983 indicate total costs to be about 73 billion rupees (at 1983 prices and exchange rates).

The AMP is a river basin development program involving both power and irrigation. From the outset the goals of AMP have linked agricultural production and income benefits with employment generation, regional development and with a distribution of productive assets (essentially land) for the benefit of the poor and landless.

1.2 Background to the Evaluation

1.2.1 U.S. Assistance

The purpose of the USAID projects has been to aid GSL in achieving the AMP economic and social goals by providing funds and technical assistance for parts of the overall program which are "downstream" from the main dam structures. The three projects being evaluated are the Mahaweli Basin Development Project Phases I and II and the Mahaweli Sector Support Loan. Phases I and II started in 1980 and 1981 respectively, and U.S. assistance is due to be completed in 1986. Sector Support started in 1981 and is to be completed in June 1985. The three projects have a combined value of U.S. financial assistance of \$ 170,000,000.

U.S. funds in Phases I and II are focussed on providing funds for design, supervision and technical assistance for construction of main and branch canals on the left bank of System B through Zone 4A.

The Sector Support project aims to flexibly provide GSL with non-inflationary funds which will promote adequate downstream development and relieve pressure on the balance of payments. Under this scheme GSL rupee expenditures on the range of downstream activities such as land clearing, on-farm development, construction of social infrastructure (such as schools, health centres etc.) and irrigation and drainage canals as well as certain types of headworks construction are reimbursed with rupee funds generated through Special Letters of Credit.

1.2.2 Purpose and Approach of the Evaluation

The evaluation is a mid-term evaluation of Phases I and II and an end-of project evaluation of the Sector Support Loan. Underlying the team's approach to the evaluation has been a recognition of the fact that while USAID financial contributions for capital construction may be a necessary pre-requisite for achieving goals for the AMP, they are not on their own sufficient for success. Furthermore, there is a lag between the conclusion of construction work and the establishment of the socio-economic momentum which is hoped for. Thus End of Project Status for Phases I and II will not be reached in 1986 when the projects are supposed to be completed. The link between USAID capital assistance and GSL goals is embedded in a set of other conditions which are outside USAID control but which have a direct impact on the effectiveness of USAID's contribution.

The team's findings are based on review of relevant reports, interviews with USAID and MASL officers in Colombo and a nine day field visit to Systems H, C and B. In the field the team was assisted by five Sri Lankans who did settler interviews. The Sri Lankan consultants included an agricultural economist, two sociologists and two public health specialists. The team was also accompanied by various representatives of the USAID mission and by Mr Asoka Cooray of the PMU. Throughout its time in the field and in Colombo the team has greatly appreciated the unstinting assistance received from everyone concerned.

Unfortunately security disturbances in the System B area made it necessary to curtail the field review in that area after only one day visiting the project headquarters in Aralangawila. However, it has been possible to use progress reports and inferences from Systems H and C to support our general conclusions regarding the three projects.

1.3 Finance, Program Planning and Administration
For Phases I and II

1.3.1 Conclusions

Implementation of what is, after all, a complex and ambitious undertaking compares favourably with experiences with similar exercises in countries elsewhere in the region. Nevertheless, it must be recognized that progress has been slower and costs higher than anticipated.

The Accelerated Mahaweli Program (AMP) including System B, Left Bank, continues to be a high priority program which the GSL is determined to complete on the revised time schedule by 1988/89. Some difficulty may be encountered in meeting the completion target (sections 3.1-3.3).

The pace of the AMP development is heavily dependent on a continued high level of donor support, particularly in the downstream consolidation, maintenance and off-farm regional development phases (section 3.4).

Administrative, budgeting and reporting capacity are adequate and improving, but they are not nearly as good as was postulated in the Project Papers and the 1983 Progress Review. Reporting is detailed and time and resource consuming but not management decision or action oriented. USAID monitoring of GSL financed activities needs strengthening and more participation by non-engineers (section 3.5.).

More attention needs to be given to "consolidating" gains in all Systems in order to accelerate production and income benefits through improved operation and maintenance of infrastructure and improved pricing, storage, marketing and related facilities for farmers. It may be helpful to support these activities with local currency financing from food aid or additional sector loans, within the framework of suitable GSL policies (section 3.6).

1.3.2 Recommendations

- (1) The Mission needs to organize its own efforts to assure that agricultural expertise is a major part of what is, above all, an agricultural project; and that Mahaweli agricultural efforts relate to those in the rest of the country.

- (2) The GSL and Mission should develop a revised work program for the completion of System B with a revised time-phased cost-estimate and financing plan.
- (3) GSL and Mission should consider whether the O + M technical assistance contract under Phase II can be used effectively to strengthen the Planning, Budgeting and Reporting Systems in MASL to make them more action and decision oriented. Reorganization of PMU to strengthen its planning capability should be part of this effort.
- (4) GSL and donors need to cooperate to strike a proper balance between additional capital investments and increased efforts to strengthen O + M operations and to promote regional development. Efforts to increase the rate of agricultural production and incomes in the systems already settled may have a larger pay-off than settling new areas.

1.4 Infrastructure Development

1.4.1 Phases I and II

1.4.1.1 Conclusions

AID contributions being provided under the project are achieving output results towards meeting the ultimate project purposes of developing an operable irrigation area of 21,800 ha. along the Left Bank of the Maduru Oya in System B of the AMP. The Transbasin Canal, providing 60% of the water to the System is in place and operating; the downstream infrastructure for Zone 1 and 5 is underway and 60% complete; the construction of the main and branch canal system for Phase 1 (a) of the project is 92% complete and for Phase 1 (b), just getting underway, is 10% complete (section 4.1.2).

Infrastructure development financed and implemented by the GSL for System B downstream facilities is not meeting planned completion targets. Zone 5 is substantially complete. However, in Zone 1 Blocks 101 - 104A, where the branch canals being constructed under Phase 1 (a) are expected to be operating by September 1985, the D and F distribution canal systems are estimated to be only 35% complete. It is not expected that these systems will be completed by September, 1985 to meet the scheduled opening of Phase 1 (a). It is questionable if the total

distribution Systems for Zone 1 will be completed in time to meet the Maha planting season for Zones 2,3, and 4A. Little to any development has started for the D and F distribution canals and drainage channels. Construction of Phase 1 (b) is planned for completion in October, 1986 (section 4.1.3).

The construction progress of the main and branch canals, Phases 1 (a) and 1 (b), under the contractor's revised schedule of work shows that all work is expected to be completed by October, 1986. However, if civil strife continues in the area these completion dates will not be met and additional claims will arise under the Special Risk Clause of the construction contract (section 4.1.4).

The recent action by the prime contractor, Zachry/ Dillingham, of initiating claim arbitration against the project will require a major involvement of time and resources by MASL staff and the site B/I Construction Manager. Additional B/I and MASL staff should be immediately assigned to the project to work on these issues (section 4.1.5).

Project funding available under the Phase I and Phase II loan authorization is considered sufficient to complete construction and supervision services. It is presently estimated that construction costs for completion of work will increase by \$8.0 million, from \$94.0 million, to a level of \$ 102 million for an 8.5 percent cost increase. The \$94.0 million construction cost is based upon an initial tender price of \$91.8 million plus an inflation cost of \$2.2 million. The supervision cost (FX) is estimated to increase by \$2.8 to a level of \$8.0 million for the combined design and supervision services provided by Berger/IECO, for the project. The total \$8.0 million cost is based upon a design cost of \$2.4 million and a supervision cost, projected to completion of all work by mid-1987 of \$5.6 million. However, if claim arbitrations now being initiated by the construction contractor, Zachry/Dillingham, are successful the GLS may well be responsible for payments which exceed the funds which are available within the Phase II loan authorization (section 4.1.6).

Implementation of the irrigation development model in the Pilot Area of Zone 1 has been delayed for over three years and no longer has the impact value of replication throughout System B. A review of this activity should be made to determine what effects further implementation of this activity would have on B/I staff requirements and increased costs to the B/I contract (section 4.1.7).

Mobilization of the U.S. firm CH2M Hill, which is providing technical assistance to design and implement an operations and maintenance program for System B, is a timely and needed input to the Mahaweli System. The net result will be positive and should provide a viable maintenance program for the system (section 4.1.8).

The project monitoring by USAID/MWRD office staff for the Phase II project is satisfactory. However, the amount of project reporting being made is not sufficient for the complexities and problems the project is now facing. The reporting by USAID staff of the project activities needs improvement. The monthly Project Engineering Report prepared by B/I for MASL, and distributed to USAID, should be revised to provide a reporting format conforming to AID capital project reporting requirements (section 4.1.9).

1.4.1.2 Recommendations

- (1) That MASL concentrate their resources and make a determined effort to complete the water distribution system for D and F canals and the drainage channels in Zone 1 of System B to meet the September 1985 opening of the Phase 1(a) main and branch canals.
- (2) That MASL realistically plan and implement a construction program for the water distribution systems of D and F canals and drainage channels for Zones 2 and 3 of System B such that by October 1986 a maximum connected distribution system is in place to advantageously use the water available from the onward construction of the Phase I (b) main and branch canals.
- (3) That MASL take immediate steps to fill the staff position of contract administrator (Claims and Arbitration) approved for the B/I field office and currently assign a person at MASL/Hq. to assist the B/I CM in claim and arbitration issues being initiated by the Contractor, Z/D.
- (4) That the USAID/MWRD office increase project reporting and on a quarterly basis prepare a status report on System B infrastructure development related to both the Phase II project and the GSL financed downstream infrastructure program. The report format would be similar to that prepared for Mission Directors Project Implementation Status Review Meetings.
- (5) That USAID take the necessary action, with MASL approval, to modify the B/I Monthly Engineer's Project Report for the Phase I project to provide a reporting format similar to that used by AID for construction reporting of AID funded capital projects.

1.4.2

Mahaweli Sector Support Loan

1.4.2.1 Conclusions

Local funding support was available for infrastructure development. However, the information available to evaluate how effective local cost support was in helping to meet planned infrastructure targets was limited. In only a few specific cases could local cost support be related to the planned targets of development, as stated in the USAID/MASL jointly agreed budgets (section 4.2.2)

Planning was considered adequate in scope and purpose in identifying the annual program of activities and cost requirements for infrastructure development. (Section 4.2.3).

Effective implementation of planned activities fell short of planned targets, a major constraint in downstream development. Follow-on maintenance programs are noted to be marginal in scope and have a low priority in the project budget (section 4.2.4).

Adequate levels of funding were maintained for downstream development as planned. However contract administrative problems, such as failure to complete the work as scheduled, resulted in shortfall in the disbursement for approved budget activities, a factor which has become a major constraint in the implementation of the planned construction and maintenance program (section 4.2.5).

~~The adequacy of USAID monitoring of project activities satisfied formal requirements but was not a useful management tool. The monitoring requirements established by the project agreement were fulfilled. The GSL monitoring and reporting procedures are extensive and detailed. However, the format of reporting did not provide ready information to assist in management decisions (section 4.2.6).~~

1.4.2.2 Recommendations

- (1) Any future Aid local cost support funding for infrastructure development should be tied to controlled activities. The evaluation showed that where sector support funds were identified with discreet infrastructure activities, under job and specification controlled conditions, such as the Transbasin Canal and the ADB road projects, the results show a higher quality of work and a more effective use of funds.
- (2) AID should not consider future funding for local cost support of road projects where work is being carried out by GSL parastatal firms.

- (3) MASL should establish an operating policy for the maximum use of settler employment in maintenance operations of the irrigation systems, especially during closed season maintenance requirements.
- (4) MASL should institute a policy to minimize the transitional take-over time period between the completion of facilities by MECA and hand-over to MEA. The policy should cover Authority responsibilities for security and maintenance during the transition period.
- (5) MASL should revise the policy of small scale contracts to require :
 - (a) Packaging of SSC into larger units and delegating authority to the RPD and RPM at the project level to award packaged contracts up to Rs 2.0 million (US\$ 75,000).
 - (b) Providing a realistic time for completion of work.
 - (c) Requiring the contractor of package contracts to provide construction materials.
- (6) MASL should develop, from the downstream point of responsibility in the irrigation system, a standard maintenance program for the Mahaweli system. The program would establish a frequency of maintenance schedule for facilities and provide the staff and funds to implement the program. This program should be developed in conjunction with the technical assistance now being provided under the AID funded Phase II Project for development of an operations and maintenance program for System B.
- (7) MASL should, under the PMU reporting services, develop a reporting format that will provide Mahaweli Management with "hard-fact" data to assist in the decision making process.

1.5 Agricultural Development in Systems H, C and B

1.5.1 Conclusion

The MASL, through MEA and with the assistance of the USAID Sector Support Loan, has provided a wide range of services and grants to assist new settlers with the agricultural development of their plots. In general these services and assistance have been provided in a reasonably efficient and timely fashion considering the pressures of the accelerated project and the manpower resources available to accomplish a very sizeable task. The implementation has improved with progression from System H to C and B. Lessons have been learned such as extending the distribution of World Food Program Aid when irrigation water is not available, assistance with land clearing, land preparation, well digging, tile roofs, and now better selection criteria for new settlers, particularly those selected from the electorates (section 5.2.1 - 5.3.4). However, closer monitoring of potentially serious environmental problem areas, such as erosion, water logging, build-up of chemical and soil toxicity, poor drainage and forest land degradation, is needed (section 5.3.5).

Existing extension staff are doing a good job, but a shortage of staff, lack of adequate transport and of soil and water management, equipment are major constraints to providing the necessary services to farmers. Non-paddy field crops, horticulture, soil and water management and general farm management need further area specific research and extension, especially for farmers new to irrigated agriculture, for women, and for families who have only been allotted a homestead plot. An extension of livestock assistance for dairy and poultry production, modeled on the Draft and Dairy Development Program, would be beneficial. Private sector agriculture suppliers could be a source of additional assistance in extending improved methods to Mahaweli settlers (section 5.3.6 - 5.3.8).

As a general observation on the Mahaweli System it can be stated that the major emphasis has been on construction, infrastructure development and settlement of the new population. The production, marketing and processing of the agricultural products resulting from this development have not attained the levels necessary to meet the goals of production and rural prosperity set for the project. Although MEA is responsible for these activities it is still largely involved with infrastructure development which should have been put in place by MECA. In System H assistance with providing inputs and developing markets is being phased out before the majority of farmers are well enough established to adequately develop these essential production elements for themselves. It is also proving difficult to effectively administer institutional credit to farmers (section 5.3.9).

Other factors which are affecting the achievement of satisfactory

farm incomes are the failure to achieve efficient and equitable levels of water management and allocation (section 5.4.1), the relative weakness of turnout groups (section 5.4.2), and the high costs resulting from the need to hire non-family labor because of strict, though unreliable, schedules of water issue (section 5.4.3).

The price farmers receive for their crops can be raised with the institution of a bonded storage system and marketing can be improved if MEA Marketing Assistants can train farmers to identify markets and adjust production and establish enterprises to meet those market demands (section 5.4.4). Credit programs can be more effective if a more realistic annual interest rate (estimated at 25%) could be charged by banks to cover the cost of improved supervision and administration. The channeling of loan funds through traditional credit courses (but at lower than traditional interest rates) may also help farmers to gain more economical access to production credit (section 5.4.5).

The potential exists for a standard 2 1/2 acre irrigated paddy plot to be financially viable. But to do so under current input costs and output prices, paddy yields must exceed 100 bushels per acre for two seasons a year. The family must supply all the labor, and a farmer must receive at least the PMB floor price for the entire crop (section 5.5.5). Diversification into the other field crops where inputs and markets are assured can be even more profitable. However, farmers inexperienced in managing irrigated enterprises of this size, facing high risks in the absence of reasonable water management, and having to depend on wage labor for about half of the labor inputs on the farm, have not been able to meet any of these requirements. As a consequence it can be roughly estimated that 20% of new settlers (those who arrived with sufficient capital and experience in irrigated agriculture) are doing well, 20% are failing or renting out their land, and 60% are just managing while they await land development, reliable water issues and an economic environment that will promote prosperity given good cultural and husbandry methods (section 5.5).

As the Authority moves into a portion of System B, which has more marginal soil conditions, other problems of support and implementation will arise. Roads and markets will become more critical in these areas in order to provide inputs and to transport production to markets and points of consumption. On marginally productive Old Alluvial and Non Calcic Brown soils (described in the Winrock Report of February 1985) water management and fertility maintenance are difficult and even more critical to profitable crop production. Considering these problems and the lower potential of Zones 4A and B of System B, thought should be given to delaying settlement in these zones until farmers in currently settled areas have consolidated their position and a high percentage of the potential annual production has been realised.

1.5.2

Recommendations

under this pros near prog

(1) Develop commodity oriented groups for production, processing and marketing of major agricultural products. Farmgate prices and marketing are the key to farmer success and rural prosperity. Current average farmgate prices are a disincentive to surplus production although present Government stated floor prices for paddy and other subsidiary food crops provide a sufficient margin of profit for reasonably efficient crop production. MEA should expand their collection and bulking activity currently being provided in a limited way in Systems C & B. This service, at the farmers expense, should also be provided in System H. This is a service that can be provided by the commodity organizations once they are established. The model provided by the Dairy Development project in Systems H & C can be used for other commodities,

- (a) Market identification.
- (b) Organization of farmers to produce for the market.
- (c) Bulking either for farmer operated enterprises and/or other processors.
- (d) Wholesaling and/or retailing where possible.
- (e) Developing the skills and leadership within the commodity producing group to integrate and operate their own commodity production, processing and marketing organization.

Ideally the commodity organization should not lose control of their product until it reaches the final consumer.

- (2) Emphasize developing the potential of the present settler population before bringing more settlers into marginal production areas. The potential exists for acceptable profits and a prosperous rural economy but due to lack of land development, reliable water issues and low farmgate prices the potential is not being realized. MEA should consolidate and concentrate on developing the income producing aspects of their projects rather than the capital absorbing infrastructure.

- (3) Supervised rental arrangements could allow a settler to rent the land to a good farmer at advantageous terms. Under the efficient management of a good farmer the land could increase in productivity rather than decrease as it does under the non-investment policy of most money lenders.
- (4) Initiate competent maintenance procedures for on-farm irrigation systems. Farmer involvement, which is necessary since MEA cannot mount the resources to provide for all the required maintenance must be based on giving turnout groups responsibility and authority over immediate resources of distributory channels, field channels, plot applications and field drains.
- (5) Establish and maintain an adequate system of field and main drains. Numerous reports of flooding, waterlogging, salinity and toxic element build-up in the soils testify to the need for an improved drainage system in all of the project areas.
- (6) Put Agricultural Credit on a Commercial Loan Basis
Current money lenders rates are 10% to 20% per month and they supply 90% of the credit needs. Commercial Banks can compete with these rates, even at a higher interest rate than is currently charged. If this is not possible then investigate, as is being done in other developing countries, working with money lenders in channeling additional credit through them at rates favourable to both the farmer and money lender.
- (7) Investigate Bonded Warehouses for non perishable agricultural commodities. Bonded ware-housing could be initiated by Government, Coops, or commodity producer organizations. These organizations could store the crop and provide farmers with cash for a part of their production at harvest. This would allow them to meet current credit and living cost commitments yet retain ownership and gain post harvest price increases. This privilege is now exercised by traders and richer farmers who are able to hold their crop or purchases for post harvest higher prices.
- (8) Provide farm and money management training to farmers. Coordinating paddy with other field crops, homestead plantings, integrating various livestock enterprises, record-keeping, annual planning and analysis, market information and development, all are important aspects of farming not always understood even by experienced farmers.

- (9) System C and B require increased agriculture staff, transportation and other working facilities.
- (10) Considering the reported difficulties of irrigating non calcic brown earth and old alluvial soils, which make up 60% of Zones 1, 2 and 3 of System B and a reported greater part of Zone 4 A and B, further research into the irrigation potential of these soils and/or non-irrigated use possibilities should be investigated.
- (11) Two other areas of agricultural research that should be investigated are macadamia nuts and maize based sugar and starch production. Macadamia nuts are higher priced and are easier to process than cashews. Considering the livestock feed by-products and higher quality sugar and starch produced from maize, it may be a profitable alternative to cane for industrial purposes.

1.6 Socio-Economic Evaluation of AMP Community Development in Systems H, C and B

1.6.1 Conclusions

Although to date only approximately 20% of settlers have been selected according to the anticipated norms, on the whole, land alienation in Systems H, C and B has probably represented a redistribution of a production asset in favour of the land poor (i.e. those owning less than one hectare) or landless. While it has not necessarily helped only the poorest and neediest, it may be considered as a land transfer which has the potential (as yet unfulfilled in many cases) of and improving the income of the direct beneficiaries (section 6.3, 6.5.5).

The level of social infrastructure and services provided for settlers has been well considered in the light of previous settlement experience and is consistent with the level of services provided in the country as a whole (section 6.4). There have been some delays in construction and, more commonly, staffing - especially of schools and health services - and inadequate water and sanitation facilities may be contributing to hardships and ill health in the first years of settlement. However the majority of settlers interviewed were generally satisfied with the social services available. Although there is room for improvement, weaknesses in the type and quality of settler services would not appear to represent a major constraint on the socio-economic development of Systems H, C and B (section 6.5).

Other community development activities such as support for turnout groups, home development education and vocational training may be criticised for not being sufficiently linked to the self-perceived needs and possibilities of the settlers and their families. The main problem is their ineffectiveness in the absence of a buoyant agricultural economy. In the highly individualistic environment of small peasant holdings operating under conditions of high risk and competing for limited resources (essentially water at this point) it should not be expected that settlers will collaborate in activities which do not offer a prospect of immediate personal gain. Only when everyone stands to gain from participation and no one can gain more by not cooperating, can turnout groups be successful (section 6.5.6).

Likewise home development training, which in any event appears to still be reaching only a small proportion of women, is probably not really addressing the immediate concerns of women who have to deal with the multiple demands of adjusting to a new and demanding environment (section 6.5.7). Finally, a settler economy where a subsistence farm income constrains the effective demand for new production and services in the area offers few medium term prospects that young people receiving vocational training will be able to earn a living by their trade (section 6.6). Underlying these observations is the inevitable conclusion that unless macro policies combine with agricultural services (particularly storage and marketing as well as reliable irrigation) to create a strong farming sector, community development programmes will never be more than palliatives administered by demoralised staff to uninterested clients.

Paradoxically, one reason for the delay in the ability of a significant proportion of Mahaweli settlers to reap the economic benefits essential for a dynamic economy has been the forced pace of settlement. The drive to construct headworks and develop lands downstream has meant that large numbers of people have had to be relocated to project areas at a rate which has surpassed the organisational ability of MASL to insure good quality of downstream infrastructure development and an assured and reliable supply of water for domestic consumption as well as irrigation (sections 4.1.5, 4.1.6, 5.4.1 and 6.5.5). Lack of a reliable irrigation supply and poor production conditions have been a contributing factor to early economic set-backs which have led a significant, although unquantified, proportion of settlers to illegally lease their land (section 6.7).

While this may have been unavoidable in the past, when more than 80% of the settlers have been either resettlers or evacuees, it can be avoided in the future, when more than 90% of settlers in Systems C and B will be selectees (Tables 6.2 and 6.3). Now is the time to learn from past experiences and introduce new settlers in a measured program based on a more realistic assessment of the time required firstly to do good quality work under

possibly difficult security conditions and secondly to create the economic environment and generate (whether by public or private means) the services which will enable the majority of settlers to derive a satisfactory sustainable income from their holdings (section 6.5.5 for analysis; section 3.4 for recommendations).

1.6.2 Recommendations

1.6.2.1 Major Recommendations

- (1) Settlement Timing. Settlers should not be required to establish residence on their allotted homestead more than 6 to 9 months before they can be assured of irrigation and of ready access to schools, community wells and health services. However, settlers can be selected more than six months in advance and should be given priority in recruitment for construction work as well as the opportunity to work on preparing their homestead.
- (2) Ethnic Composition of Settlement Population. Settler selection should only proceed when there is a clear policy of selection, consistent with the stated principles of the GSL, which assures settlers of all eligible ethnic groups an opportunity for early participation in System B settlement and an assurance that they will have a fair chance to farm on good soils at the top end of the system.
- (3) Leasing and Selling of Land. Measures should be taken to institute an appropriate informal procedure for registration of land leases to protect weaker parties from pressure and exploitation by speculators and money lenders.
- (4) Monitoring and Evaluation. Disaggregate data on the ethnic, socio-economic and demographic composition of the settler population should be collected and analyzed now to identify vulnerable groups and to enable adequate manpower planning.

Some demographic and economic data are already available (covering sex composition of family, age of family members, family size, occupations, levels of education, geographical origin, previous assets owned) for all settlers in the form of a settler bio-data sheet. Unit managers are supposed to have such a sheet completed for each settler in their unit. The Lands officer in System B is beginning to tabulate this

information. A similar exercise (using comparable methods and tabulations) should be extended to at least a random sample in all three systems and it should be updated annually. The information thus collected will not only provide currently non-existent baseline information on the demographic composition of the settler population, but it will be useful for manpower, as well as health and education, planning.

Farm budget data should be regularly collected and analysed (once per season) for a representative panel of settlers including settlers on homestead plots only. This exercise, looking at farm management information for homestead as well as paddy plots, will make it possible to regularly monitor farmer production strategies (including crop and livestock mix, input use, timing of activities, etc.), costs of production, off-farm employment, and farm incomes. This information should be used in developing research and extension programs and in assessing the impact of project and national policy on farm incomes. Among other things, it would make possible a more accurate analysis of the sort demonstrated in section 6.5.5.

There should be more cross-tabulation and critical analysis of currently collected monitoring data. For example, the installation of various social services (wells, latrines, staffed schools and clinics) should be compared with the number of settlers in place and the length of time they have been there. Land permits issued should also be compared with the number of settlers in place and awaiting permits. Area irrigated should be compared with the area alienated, cultivated and harvested in any given season. Analyses such as these can be more action oriented than a mechanical comparison of "actual" achievement versus, sometimes arbitrarily set, targets.

There should be a special study focused on the groups which are tending to lease and sell their land. This should subsequently be followed up with regular monitoring of this group.

1.6.2.2 Other Recommendations

(1) Health Services

- (a) Overall administration of System H will be improved if System H is designated as a separate MOH area. Until this can be accomplished, supervision and guidance of Family Health Workers (FHW) and Public Health Inspectors (PHI) can be improved by the appointment of a Coordinator of Medical Officer Status to System H. MASL has medical officers appointed who should perform this function in Systems C and B.

- (b) Pahalapotiyagama. It should be noted that the Pahalapotiyagama area is currently not under the jurisdiction of any MOH area and is consequently without the services of either an FHW or a PHI. The RD Anuradhapura should allocate Pahalapotiyagama to MOH area Anuradhapura and appoint a PHI and an FHW to serve the area.
 - (c) Regular duties of the Health Coordinator. As part of regular duties the Health Coordinator should monitor the state of repair and the supplies at the health facilities and promote regular and timely meetings between health staff and the MASL CDO and Unit Managers to ensure a coordinated effort regarding construction of wells and latrines.
 - (d) Maps. MASL should supply maps of their areas showing land marks and roads to FHWs and PHIs.
 - (e) Health Volunteers. There is a need for a clearer definition of the goals, responsibilities and position of Health Volunteers in relation to MOH staff. Health Volunteers should be made to feel part of the local health team, rather than owing their allegiance to the Unit Manager. A more cooperative attitude can be promoted if Health Volunteers are incorporated in MOH local staff meetings and if the MOH is asked to assist in the distribution of health supplies to the Health Volunteers.
 - (f) Health Needs Assessment. A health needs assessment for the Mahaweli area is currently being undertaken with the support of USAID. The co-operation and interest of MASL has been most important in the initiation and implementation of this assessment and it will be even more important in subsequent follow-up activities.
- (2) Housing - Poor housing with inadequate ventilation is contributing to ill health among settlers. MASL has contributed to an improved standard of housing by providing roof tiles and house plans. However, it would appear that the MASL house designs are still beyond the means and/or construction capabilities of most settlers. If MASL does not have the in-house capability to do so, assistance should be sought in developing an improved housing design which will be both financially realistic and consistent with settlers customs and preferences. It should be of a design and using traditional materials such that settler health and living conditions can be improved from the time of the settlers arrival rather than having to wait the

several years which often pass before a "temporary" house is replaced by a permanent one. Training in the construction of such a house should be included in the settler orientation curriculum.

- (3) **Settler Training** - A special effort should be made to promote the attendance of resettlers and of more women in orientation and training courses. A special training program on intensive dry zone farming methods and paddy farming under major irrigation for evacuees and particularly resettlers in Systems C and B will help to overcome some of the resistance which is commonly remarked on by MEA staff.
- (4) **Availability of Skills** - If it has not done so already, MEA should undertake a skills demand and supply inventory, projecting forward over the next 10 years to provide a basis for settler recruitment as well as vocational training.
- (5) **Turnout Groups** - The leaders of Turnout Groups should be given a financial incentive to do their job and the legal authority to punish members for infractions. MASL should consistently give adequate notice of water issues, should adhere to the promised dates, and should be responsive to the Group Leader's requests for the correction of irrigation system defects. The Groups should also be recognized as a viable entity to bid for contracts to do maintenance work and should be encouraged to undertake other production-oriented activities, such as group loans, group purchasing of inputs and group transport of produce.
- (6) **Community Participation** - Community participation in official settlement decision making will only be a reality when there is a substantive rather than simply a formal acceptance by MASL officers of settlers' views and suggestions.
- (7) **Support For Women's Non-Farm Needs** - Vocational training for young women should be based on adequate market research and should be backed up by access to credit for the purchase of equipment and initial operating capital.

1.7 The Mahaweli Sector Support Loan

1.7.1 Conclusions

The sector loan has achieved its basic objectives of providing non-inflationary financing for the AMP, of encouraging adequate

budgets for downstream activities, and of relieving the B.O.P. These accomplishments are recognized by senior GSL finance officials but are obscured by serious faults in implementation on the USAID side and by some administrative problems on the GSL side, which were exacerbated by failure of USAID to communicate rules clearly to GSL.

The high flexibility of the loan permitted MASL to use the funds to fill gaps - as a last resort. This was useful to MASL finance managers and made the loan more effective but had the disadvantages of slowing down the reimbursement and disbursement process.

Among factors which contributed to the reduced timeliness of the administration of MSS were :

- major changes in the program concept of the authorization, which complicated administration and slowed operations;
- no agreed or consistent format for developing either budgets or reports;
- monitoring was largely confined to fiscal and eligibility problems with less attention to progress in relation to budgets or to physical targets (or assessing whether physical progress was in line with expenditure);
- insufficient attention to changes in time phasing and costs;
- insufficient attention to modifying procedures for using dollars in the light of changing conditions.

In addition dollar reimbursement was delayed because the Mission decided to preaudit GSL reimbursement requests prior to requesting opening of L/Cs. Adjustments could have been made in connection with subsequent payments if necessary. But most of the items disallowed seem eligible under the terms of the loan agreement.

While these problems did not, in the final analysis, seriously affect the desired impact of the loan, the resulting image was poor and led to criticism. Administration should be improved if this type of operation is undertaken again. (Only marginal changes are possible, and being initiated for the present loan, since it is close to termination).

1.7.2

Recommendation

The Mission should support IBRD recommendations which call for a sustained level of program (including food aid) as an important element of the effort to assist Sri Lanka, in view of budget and foreign exchange pressures. The policy framework for such aid needs careful attention. Mission management of these programs could be improved by involving more closely program, economic and controller staffs in the design and management of these programs. The pricing of commodities into the economy, particularly food, needs to be watched closely.

2. BACKGROUND TO THE EVALUATION

2.1 Project Rationale and Description

This evaluation is concerned with three separate AID projects:

Project No. 383-0056 - Mahaweli Basin Development-Phase I
Project No. 383-0073 - Mahaweli Basin Development-Phase II
Project No. 383-0078 - Mahaweli Sector Support (MSS)

Fiscal data for the U.S. financed portion of these projects are in Table 2.1. The evaluation is a mid-term evaluation for the first two projects and a final end-of-project evaluation for the Sector Support Project. The three projects are being considered together because they all relate to the Accelerated Mahaweli Program (AMP), a high priority and highly visible undertaking of the Sri Lanka Government (GSL). Activities, program purposes and goals for the three projects are overlapping and directed to the same objectives, so that an integrated presentation is best suited to serve as a basis for analysis of program progress, for identification of issues requiring resolution and for consideration of future action. This approach is also appropriate since AID finances less than half of the total effort required to achieve the purposes of the last two projects, the remainder being provided by other donors and by the GSL. The status of specific AID financed activities (outputs) will emerge from the discussion. In addition there will be a separate section regarding the operation, administration and budgetary and economic impact of the Sector Support Loan and regarding the utility of this kind of loan in the future (see Chapter 7).

The AMP is a river basin development involving both power and irrigation. Its main objectives are generation of electric power, settlement of poor, landless and displaced populations in newly irrigated areas of the country, self-sufficiency in food production, increased employment and incomes and regional development. U.S. activities are chiefly concerned with parts of the overall program that are "downstream" from the main dam structures most of which serve both power generation and irrigation purposes. The entire effort is supported to varying degrees by thirteen major donors (who have each contributed more than \$ 9 million); United States, United Kingdom, Canada, Federal Republic of Germany, Japan, Kuwait, Saudi Arabia, Australia, as well as IBRD/IDA, ADB, OPEC, EEC and the ADB.

During 1983-1985 about 60% of Mahaweli development expenditures were aid financed. The AMP was originally proposed in 1979 as a

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**Table 2.1 : U.S. Financial Assistance for Mahaweli Phases I & II
and Sector Support**
(\$ Thousand)

	<u>Obligated</u>	<u>Committed</u>	<u>Expended</u>	<u>Pipeline</u>
<u>Mahaweli Phase I</u>				
Design & Supervision	9,600	6,933	4,663	
Environmental Mitigation	400	299	293	
Total	10,000	4,956	4,956	5,044
<u>Mahaweli Phase II</u>				
Grant	3,000	1,000	35	2,965
Loan	107,000	85,000	62,825	44,175
Total	110,000	86,000	62,860	47,140
<u>Mahaweli Sector</u>				
Support Loan	50,000	50,000	44,000	6,000

Note : This table reflects status as of March 31, 1985
Source: USAID Controller

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five-year program estimated to cost 38 billion rupees. It is now expected to be completed by 1988/89 and most recent estimates made in 1983 indicate total costs to be about 73 billion rupees (at 1983 prices and exchange rates).

The first two loans cited above (Mahaweli Phase I and II) relate primarily to the downstream development of that part of the Mahaweli Basin identified as "System B, Left Bank", located on the left bank of the Maduru Oya (River) in the Central North Eastern part of the country. The Mahaweli Phase I loan for design and supervision of construction (Berger/IECO Contract) of main and branch canals also includes design for System B, Right Bank of the Maduru Oya, with construction to be financed by other donors. Originally the Phase I loan was expected to finance construction supervision for System B (RB), but it now appears that available loan funds will be fully utilized for supervision of construction in System B (LB). Cost estimates and cost benefit calculations for Mahaweli Phase I and II relate primarily to the development of System B, Left Bank.

Mahaweli Phase II, the project to develop System B, Left Bank, consists of two major elements. The first element, is the construction of a main canal and of a system of branch canals. This construction is financed by the U.S. with some contribution from the GSL. The main canal supplies the system with water originating at the Maduru Oya dam and reservoir (built with Canadian assistance). The other element includes a wide range of activities which are generally referred to as "downstream" activities. These include: the construction of distribution and field canals and other infrastructure needed before settlement - including drainage, roads, jungle clearing, land preparation and social infrastructure. These downstream activities also include other actions needed to prepare for settlement, to actually bring in settlers, to help support them before agricultural activities can get underway, to provide some initial capital for agricultural production, to maintain the publicly owned infrastructure in the area, and to operate support services during the development phase of the project including extension, research, training, marketing and the like. These "downstream" activities are mostly undertaken and, at least initially, financed by the GSL. Some road construction is financed by the Asian Development Bank (ADB). A large fraction of GSL expenditures for activities in System B (LB), is subsequently reimbursed from the Mahaweli Sector Support Loan and from Saudi, Australian and EEC aid programs.

The third loan (MSS) benefitted Systems B, H, C and G as well as some of the upstream engineering structures and resettlement activities of persons displaced by upstream dam construction. This loan essentially provided local currency budget support on a reimbursement basis to pay for local costs of selected activities in the Mahaweli Region, principally activities of a downstream

nature. GSL plans, budgets and performance were reviewed annually in connection with the consideration of GSL budget proposals included under the terms of the loan and quarterly in connection with reimbursement requests.

Mahaweli Phase I also included \$400,000 for commodities, training and technical assistance to identify specific actions, needed to mitigate the environmental impact of the AMP, that could be supported by additional US assistance funds. As a result of the work financed under Phase I, a new project was developed -- No. 383-0075, Mahaweli Environment, expected to cost \$ 5 million -- to assist the GSL with the setting aside of forest preserves and of habitats for displaced wild animals. This project is now under way and is not included in the present evaluation. Nevertheless, some aspects of the environmental impact of the AMP such as clear cutting and erosion, will be referred to elsewhere in this report (see section 5.3.5). The work under Phase I and the subsequent Mahaweli Environment Project are in partial fulfilment of the recommendations of a comprehensive study of the environmental impact of the AMP that was carried out by TAMS in 1979/80.

Since agricultural and socio-economic development issues loom large in the development of the downstream AMP and since most of the non-Mahaweli AID program in Sri Lanka is concerned with agricultural development, there is a close relationship between the three projects being evaluated and other AID financed programs in Sri Lanka. Moreover, because of its size, in terms of land area and population affected, and also in budgetary terms (about 40% of the GSL capital budget), AMP downstream activities are closely interrelated with other agriculture programs of the GSL.

In consequence this evaluation extends beyond the design and construction directly financed with U.S. funds to focus more heavily than might otherwise be the case on the general operation of the Mahaweli Authority of Sri Lanka (MASL) and its subsidiary organizations.

2.2 Purpose and Scope of the evaluation

The purpose of the evaluation is stated in the Evaluation Team Work Order as follows:

"The evaluations are to be undertaken to analyse and assess the performance and results of the three projects including the degree to which the project purpose has been accomplished and the effectiveness of the USAID/GSL inputs and resulting outputs of the three projects.

The Mahaweli Basin Development Project Phases I and II mid-term evaluation is to be undertaken in March/May 1985. The evaluation is to provide information relating to the effectiveness the USAID contributions are having in assisting the GSL in meeting the project goals of reducing unemployment, increasing food production, providing land to the poor and landless, meeting settler needs and providing services to settlers. In addition, the evaluation is to determine if satisfactory implementation progress is being made toward completing those parts of the project being financed by the GSL and/or other donors to assess the likelihood of GSL financing for the remainder of the project.

The evaluation of the Mahaweli sector support project is an end-of-project analysis and will be undertaken in conjunction with the above mid-term evaluation. The sector support project evaluation will analyse USAID/GSL actions to provide an objective and rational basis for determining the success of this type of project and to assist in appraising the viability of this or a similar type of project for use in the future."

The Project purposes for the three AID projects have been stated as follows:

- a) Mahaweli Phase I: Design and Construction of irrigation network serving System B of the Accelerated Mahaweli Program and mitigation of adverse environmental effects.
- b) Mahaweli Phase II: "Development of the area of System "B" of the Accelerated Mahaweli Program lying along the Left Bank of the Maduru Oya (River)."
- c) Mahaweli Sector Support: "Adequate level of financing for activities of the AMP, primarily those "downstream" with the subsidiary purpose of relieving balance of payments pressure."

The evaluation team has proceeded on the understanding that the Mission wanted an assessment of progress toward developmental targets in System H and C as well as in System B, even though the main weight of U.S. involvement is in System B. Even in System B the U.S. financing provided under the Phase II loan is about 43% of the total cost of the project as estimated in 1983. In evaluation terms this makes for a rather remote connection between the achievement of U.S. financed outputs and the achievements of the project purpose, leaving wide scope for the impact of external factors which are, as a rule, less under the control

of US managers (see section 6.1 for an elaboration of this point).

Bearing in mind this tenuous connection between U.S.-financed outputs and the achievement of broader developmental goals, the evaluation has undertaken to:

1. Assess finance, program planning and administration in the areas principally supported with U.S. assistance funds (discussed in Chapter 3).
2. Measure progress towards the targets set for U.S.-financed inputs under Mahaweli I and II and Sector Support (essentially construction of main and branch canals in System B and other downstream infrastructure work in Systems H, C and B. See Sections 4.1 and 4.2).
3. Assess the progress of the MASL towards the settlement, production and incomes targets of the AMP (discussed in Chapters 5 and 6).
4. Assess the budgetary and economic impact of the MSS and analyze the method of its operation and administration (discussed in Chapter 7).

3. FINANCE, PROGRAM PLANNING AND ADMINISTRATION FOR PHASES I AND II

The following points will be addressed in this chapter:

- review of cost estimates to completion of Phases I and II on the left bank of System B;
- validity of the cost/benefit assessment;
- role of the MSS in financing the development of System B (LB);
- availability of financing to complete the projects;
- overall planning, budgeting, and reporting considerations;
- economic setting for the projects.

3.1 Review of Cost Estimates for the System B (LB) Projects

In general it may be said that overall performance in the construction of the irrigation facilities, in land preparation and settlement as well as in getting initial production, mostly rice, started, has been most impressive, even though costs have risen more than postulated, schedules have slipped, and there have been other specific problems, some of which will be discussed below. There may be scope for off-setting increases in costs if the GSL gives increased priority and resources to the balance of the AMP program which has lagged. Areas requiring attention include crop diversification, increased processing of agricultural products, improved marketing, pricing, and farm income generation and off-farm employment. Nevertheless it must be recognised that at the present rate of progress and without considering the effect of potential security problems, it is not likely that presently planned funds are adequate to complete System B (LB) in its entirety.

Cost estimates were last prepared for System B (LB) in 1983 when the entire project area was expected to reach the production stage in 1986/87. Moreover, the financial planning of the GSL, as reflected in the current 1984-88 Five Year Public Investment Plan (PIP), is based on the completion of the project by 1987. The implication of this assumed completion date can be seen in Table 3.1. Expenditures were expected to peak in 1985 at 1716 million rupees with only 152 million rupees budgeted for 1987. The 1983 MASL operational budget, prepared subsequently, allocated 1494 million rupees for the Left Bank project and nothing for the Right Bank.

According to the 1985-1989 PIP, which was recently published, after most of this report was written, some of the funds originally planned for 1986 have been shifted to 1987. This

change reflects the slow down in development which has occurred. Zone 1 was initially scheduled to have water for Maha 1984/85, but according to the engineering section of this evaluation report (see section 4.1.3), it now seems doubtful that water will be available for all of Zone 1 for the 1985/86 Maha season, because the distribution and field canals are not likely to be ready. Similar delays in the construction of distribution and field canals seem inevitable in Zones 2 and 3. Thus there is a probable delay of at least 18 to 24 months in completing this part of the project which will affect costs, as well as delay production and benefits.

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 Table 3.1: Development of System B Mahaweli Investment Budget
 (Rs Million)
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	1984	1985	1986	1987	1988
Left Bank Total	1000	1716	1654	152	-
Left Bank Foreign Aid	813	1432	1383	106	-
Right Bank Total	150	673	1107	1288	497
Right Bank Foreign Aid	114	567	888	1053	348

Source: Public Investment Plan - 1984 - 1988
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In addition to indicating the need to review the cost implications of construction delays, the table also underlines the heavy dependence of the program on foreign aid. The values in the table include reimbursements from the Mahaweli Sector Support Loan due to expire at the end of June 1985, with a possible shortfall in total loan disbursement. Such a shortfall will represent a reduction in the value of foreign aid actually available for downstream development.

In 1983 local costs of the project were estimated, according to the Project Paper for the Mahaweli Phase II Amendment (383-0073) dated October 1983, at about 3 billion rupees. Yet, more than this will have been spent by the end of 1985 with the bulk of the work yet to come. It is not possible to determine the likely costs of this additional work because financial planning of local costs is done on an annual basis and it is not considered that the preparation of a revised cost estimate to completion of the project, beyond what is in the PIP, would serve a constructive purpose.

On the foreign exchange side, the U.S. construction contractor appears to be meeting the revised schedule. The engineering

chapter of this report (section 4.1.6) concludes that current cost estimates are still within the range contemplated in 1983. However, the arbitration procedures being initiated could affect overall costs and could result in charges to the GSL beyond the loan authorization. The engineering chapter stresses the urgent need for MASL to assign competent and experienced personnel to assess the claims and to prepare technical, financial, and legal briefs for use in connection with possible arbitration proceedings.

The Mission maintains current records of U.S. AID dollar funds committed and expended for the Mahaweli program. The monitoring of the U.S. contractors provides data on completion costs for the main and branch canals. However, no systematic records are maintained by USAID with respect to expenditures by the GSL and other donors. The Mission relies for cost and progress data on reports supplied by MASL which do not, as discussed elsewhere, readily lend themselves to analysis. Since the programs managed by MASL form such an important and integral element of the Mahaweli Phase II project, the Mission needs to devote more time and resources to the monitoring of this part of the project, placing greater reliance than heretofore on the non-engineering staff of the Mission which has much of the needed expertise. It is also suggested that time and resources required to complete System B (LB) be reviewed in greater depth in connection with the contemplated follow-on activities.

3.2 Validity of the Cost/Benefit Assessment

Cost/benefit calculations for this project were initially prepared by Acres International and CH2M Hill in 1980. These calculations served as the basis for the approval of the project by AID. The original analysis showed an IRR of 10.1% with a range from 8.4% to 11.6% depending on assumptions. A sensitivity analysis subsequently prepared by Acres indicated that the IRR would not be significantly affected by reasonable delays in bringing the area into agricultural production. In 1983 the Canadian government asked Acres to review its calculations in connection with the planned Maduru Oya dam construction. According to the PP of October 1983, Acres concluded that costs and benefits had increased by about the same margin and that therefore recalculation of the project IRR in the light of the revised data should yield answers in the same range as the original analysis.

The further rise in costs suggests the need for a review of anticipated benefits, particularly in the light of recommendations elsewhere in this report (Chapter 5) regarding the need to assure appropriate farm gate prices for paddy and for other crops and for an increased effort to create a price support and

marketing framework capable of assuring that the desired benefits will be obtained.

Another area which will influence the actually realised IRR is the quality of construction and maintenance. The engineering section of this report discusses areas where quality of construction has been poor; and indicates that maintenance suffers from low priority and a low level of resources. The experience of Gal Oya has demonstrated how costly this kind of neglect can be and why a planned and funded maintenance program is needed to correct this situation.

3.3 Role of the MSS in Financing the Development of System B (LB)

Achievement of project purpose in System B depends heavily on the resources devoted to activities downstream from the branch canals and on the effectiveness with which these resources are applied. It was anticipated that the MSS would play a major role in financing the downstream activities, particularly in Zone 1 and 5. However activities have been slower than anticipated in getting under way and funds are budgeted from OPEC and Australian aid to pay for about half of the requirements in 1985. No data are available on how much GSL spent from its own funds in System B. Through the end of 1984 the contribution from the MSS amounted to about 114 million rupees most of which was spent during 1984. As discussed in the special chapter on the MSS (Chapter 7) it is expected that the proportion of GSL funds required for System B will rise after the end of this year, with the expiry of the U.S. and EEC aid reimburseable aid programs.

3.4 Availability of Financing to Complete the Project

The Mahaweli program is one of the top priority programs of the GSL. In recent years, when budget deficits have forced curtailment of investment expenditures, the AMP has either been spared or suffered less than its proportionate share of the reductions. Significant amounts of local cost foreign financing are budgeted for System B, in addition to the donor financing of foreign exchange costs of major infrastructure. In Zones 1 and 5 commitments to reimburse about 50% of local costs have been received from OPEC and from Australia; another 18% has come from the MSS. In Zones 3 and 4 about 90% of local costs are budgeted to be reimbursed from Saudi Arabia and EEC aid funds (of which EEC accounted for about 20%). All of these funds except for the MSS and the EEC aid, are expected to continue to be available after 1985.

If USAID proceeds in accordance with the recommendations of the recent AID draft audit report and of this report and brings its eligibility rules for the MSS more in line with the concepts originally contemplated, it may be possible to reimburse an increased amount of System B local costs during the first half of 1985, freeing up some funds already budgeted for 1985 for expenditure in the second half. Finally, the delay in starting work on the Right Bank project, which may well persist into 1986, will also free up funds already budgeted for the AMP. Barring unforeseen circumstances, funding will continue to be available to complete Zones 1 through 4A of System B (LB), although the pace may have to be adjusted further to the availability of funds.

3.5 Overall Planning, Budgeting and Reporting Considerations

Planning, budgeting, reporting and monitoring with respect to the AID financed construction contract is discussed in the engineering section. This section therefore deals mostly with MASL efforts in this respect as they relate to local cost activities, partially financed by donors on a reimbursement basis, and to the Mission response. Additional comments on USAID administrative procedures are also contained in the chapter of this report on the MSS (Chapter 7).

About half of the financial analyst's time was spent with Resident Project Managers (RPM) in Systems H, C & B, the MECA Project Directors and their Accountants to review budgeting, accounting and auditing procedures. However, field information which could be obtained from System B was limited. Not only was the accountant on study leave, but the RPM was understandably occupied with security problems. Unfortunately there was no opportunity to visit MECA in System B nor to actually review the records in place at the RPM's Office. However, the Co-ordinator was most helpful in providing information about the budget and about procedures which seemed to be about the same as in the other systems. All the people contacted gave generously of their time, and were most helpful and co-operative in providing information and data requested.

In their visit to AMP headquarters and to the offices of Systems H, C and B (LB), all team members were impressed by the quality, thoroughness and attention to detail in preparation of annual work plans which form the basis for operations. Similar care went into the preparation of budgets and project reports which were also complete and detailed, as well as timely. Reporting of expenditures and reconciliation of accounts were also carried out promptly.

Planning operations in all systems start with the preparation of uncosted work plans at the lowest level of management. These work plans reflect the view of the Block Managers in MEA and of the MECA Divisional Engineers of what is needed to meet their responsibilities within overall plans. These workplans are passed up the line to the RPMs and Project Directors where they are costed and reviewed. Finally budgets are again reviewed, this time in the light of financing availabilities, at the MECA/MEA headquarters level and finally by MASL which deals directly with the Finance Ministry.

At every field station assurance was given that work plans and budgets are prepared on a requirements basis and that limitations on expenditures have not been imposed by Colombo authorities (except in areas subject to government wide special limitations such as travel, fuel and automobiles).

Significant shortfalls in expenditures, compared with amounts budgeted (sometimes up to 50% and particularly serious in the maintenance area), were explained by a variety of non-financial factors, including heavy floods impeding construction activities, contract administration problems, slow or non-performance by contractors, shortage of administrative personnel or of fuel to permit supervision of work, and general administrative problems caused by the complexity of translating highly ambitious work plans into action.

Financial and related records are in good shape and future audits are likely to find, if present practices continue, that record keeping meets acceptable accounting standards. The AID Controller has come to a similar conclusion on the basis of inspections made some time ago. The record keeping problems that resulted in unfavourable audit results in connection with an IDA Credit for System H have been corrected with the help of detailed MASL guidance. Improved procedures were installed about a year ago, and they seem to work well, although some small construction contracts apparently are still being signed after the work has started. The much criticized preaudit procedures instituted by USAID in connection with the MSS (see also Chapter 7) may have shielded USAID from problems similar to those encountered by IDA.

However, it seems clear that the 1981 and 1983 AID Project papers predicated the three Mahaweli loans on a level of MASL administrative and financial record keeping capability which is only now being reached. While record keeping appears to be good in each location visited, the format appears to vary from place to place and this may complicate supervision, reporting on an agency wide basis, and above all, analysis. For example, it was noted that budget tables rarely compared planned expenditures to actual accomplishments in the past. This may account for some

of the evident optimism in the preparation of budgets.

Thus, no systematic effort appears to be made to analyse continuous and large deviations from the budget, nor how to integrate lessons learned into the planning process. System accountants do not seem to have any responsibility for developing overall medium term and longer term cost estimates. Furthermore the problem of developing adequate maintenance budgets (which do not receive sufficient attention or resources in any event) is complicated by the absence of a clearly understood time table for assumption by MEA of maintenance responsibilities for completed infrastructure.

The accountants that were met in the several Mahaweli systems are all young, well trained, energetic and interested in their job. Most lack broad experience, particularly in connection with construction and with projects of the magnitude of the AMP; but the training efforts recently instituted by MASL and the AID financed O&M contract with CH2M Hill should broaden their capabilities and help them to solve some of the problems cited above.

Reporting imposes a heavy workload and the benefits do not seem to be commensurate with the time and effort invested. Very extensive data is collected each month and sent to the Planning and Monitoring Unit (PMU) which publishes a series of reports and monitoring occasional studies. There is limited clerical help in the field to collect, collate and reproduce the data and submission of some information (not including that used in the monthly management briefs) may be 2-3 months late. Most local managers collect data additional to that requested from Colombo for their own management purposes.

Unfortunately the data published by PMU and made available to the evaluation team is not decision or action oriented. Extensive data manipulation would be necessary before analysis could be made of progress of particular projects or subprojects in relation to original plans or cost estimates or before such data could be used effectively for planning purposes. The quality of work done (in relation to cost) is not systematically analyzed. Relatively little time would appear to be devoted to the use of the extensive data available for the purpose of revising plans and for co-ordinating the various elements of the program. Here again the O&M technical assistance contract may provide help in remedying these problems if its attention is directed to this area as a matter of priority.

In 1985 System B development expenditures accounted for almost 30% of the total AMP capital budget which in turn consumes almost 40% of the GSL capital budget. The capital budget has been under pressure for several years because it is seen as a major factor contributing to inflation, to pressure on the balance of payments, and to squeezing the private sector. There has been special criticism of projects with long gestation periods at a time when production needs to be expanded promptly to increase incomes and savings. Generally, river development programs have a long gestation period because of the time lag between the construction of upstream facilities and bringing newly developed and irrigated lands into production with the help of newly settled populations. Additional time is usually required to bring newly developed lands into full production. In the case of the AMP, this period may be longer than necessary. Although many of the issues raised below pertain to the entire country, not just the Mahaweli region, the huge investment in the AMP requires a special effort to assure that commensurate benefits are obtained.

Improvements are possible in areas such as water management, maintenance of facilities, marketing, storage, and price support. In the absence of more rapid progress in these areas, most farmers will remain at a subsistence level and the hoped for income benefits will, at best, be long delayed (see Chapter 5 for discussion). Moreover System B poses special problems because of its remoteness and relatively poor soil. Overall costs may well be higher in System B than in the other systems and benefits may be lower and slower in coming. Additional investment in transport facilities may also be needed once System B gets into production.

Lessons for System B can be learned from Systems H and C where the AMP has made good progress in developing the planned irrigation facilities, in executing an ambitious settlement program and in getting agricultural production under way. Despite these successes, two areas which have been accorded high priority in the planning phase but which need more attention and resources in the implementation phase are: maintenance of infrastructure and regional development (under which heading the entire complex of marketing of agricultural products, off-farm employment, farm gate prices, supply and prices of inputs, storage, transport, sites and services for agro and other industry and service establishments, banking and credit should be included).

Both these problems are discussed elsewhere in this report, (Chapter 5), but the following observations can be made here. Regarding regional development, and in particular regarding marketing of agricultural products, agro-industry and agricul-

tural storage and credit, there is too much emphasis on providing government services as compared with establishing pricing and other policies which would permit farmers to generate sufficient income to finance these ancillary services and industries and to stimulate regional development. Furthermore, current efforts to improve marketing concentrate chiefly on rice while efforts on other crops have limited utility. For example, inadequate market strategy in System H has resulted in wide swings in the price of chilli and some losses to farmers or inadequate returns. Floor prices are fixed on a timely basis only for rice; yet when prices for subsidiary farm products are determined at harvest time there is little impact on production. In fact some of the impact may well be negative as farmers are discouraged by uncertainty or low prices. At least one marketing officer has expressed the view to a team member that prices to farmers must be kept in check to protect consumers. Another adverse policy is the bank requirement that small scale production credits for farmers must be repaid at harvest time when prices are most unfavourable from the farmers point of view. Moreover, most farmers lack access to storage facilities to take advantage of higher prices between harvests.

Recent results in System H suggest that with policies such as those just described only a small percentage of farmers will get beyond the subsistence level. In only one season have the original production targets been approached, and although reliable data were not made available on production costs, it appears that "family income" targets are not yet in sight. Moreover, even the production targets are unlikely to be maintained unless water management is strengthened.

This is a no-growth, or at best a slow growth, formula since subsistence farmers do not generate sufficient production and income to stimulate the development of other economic activities in the region. To reiterate, the AMP has made good progress on three of its objectives: power generation, resettlement, and rice self sufficiency. More effort is needed to help achieve the other important AMP objectives: increasing and diversifying agricultural production, increasing farm family incomes, off-farm employment, reducing unemployment generally, and regional development.

Therefore the time has come to seriously consider instituting a "consolidation" phase of the AMP particularly in System H, and perhaps also in C, which stresses maintenance of infrastructure and regional development. Given the precarious fiscal situation, the establishment of a consolidation phase may involve some rearrangement of priorities and may affect the timing of additional development work in System B. Such a reordering of priorities would be easier if donors were willing to shift some of their promised resources from development to consolidation.

Finally, the tight budget situation makes it difficult for GSL to allocate sufficient resources to finance the recurrent (including maintenance) costs of projects already completed. Additional financing such as a follow-on MSS -- which could be used for recurrent costs -- could be most effective in increasing benefits from costs already sunk in the AMP and elsewhere in SL. This in turn would generate additional income for the government to help finance capital costs later on. It should be borne in mind however, that program aid is most effective in the context of other structural and policy changes being discussed such as reduction of budget deficits, modification of the tax system to stimulate domestic activity and to reduce the bias against exports, improved intermediate credit and adjustments in the exchange rate and other price reforms.

4. INFRASTRUCTURE DEVELOPMENT

4.1 Phase I, Design and Construction, Supervision, and Phase II, Construction Services

4.1.1 Evaluation Criteria

The evaluation undertaken of the Phase I and Phase II projects is a mid term evaluation to assess the results of project activities and to determine the extent to which project outputs have been accomplished to contribute towards achieving the project purposes. This section of the report, addressing the engineering aspects, will evaluate project mid-term conditions based upon the following factors and criteria:

- (a) How effective has the AID contribution been in assisting the GSL in meeting project purpose.
- (b) Has satisfactory planning and implementation progress been made by the GSL towards completing the downstream infrastructure requirements for the system.
- (c) What is the status of the AID funded portion of the project related to construction progress, implementation problems and funding requirements.
- (c) Is satisfactory planning and progress being made by the GSL in the development of a program for the follow-on operation and maintenance of the system.
- (e) Have USAID and GSL monitoring and reporting of project activities been adequate and effective.

4.1.2 AID Contributions

AID contributions provided from the Mahaweli Sector Support loan, the Phase I design loan and the Phase II construction loan total US\$ 170 million. Expenditure of funds to date have achieved the following outputs towards meeting the project purpose. The transbasin canal, financed in part by the sector loan, is operational and will provide up to 60% of the irrigation water requirements to System B. The downstream infrastructure

development for Zone 1 and 5 of System B, financed in part by the sector loan, is in place for most of Zone 5 and is under construction in Zone 1. Construction expenditure under the Phase II loan shows Phase I (a) 92% complete and Phase I (b) 10% complete. Overall, as of June 1, 1985 downstream infrastructure in the Phase I (a) project area (Zone 1 and 5) is estimated to be 60% complete and the Phase II Main and Branch Canal construction is 70% complete. With the above facilities in-place or under construction the AID contribution is achieving the results in meeting the project purpose.

4.1.3 Downstream Infrastructure Development

A review of the progress of downstream infrastructure development in the irrigation area supplied by the canal systems being constructed under Phase I(a) of the project, shows the following:

For Zone 5, the infrastructure development is substantially complete. However, development in Zone 1 for Blocks 101, 102, 103, and 104A is currently behind schedule. The AID, 1983 review 1/ of System B showed that D,SD and Field distribution canal work had just started in Blocks 101 and 102 and no work had started in Block 103 and 104A by June, 1983. During the two year period June, 1983 to June, 1985 it is estimated that only 40% of the canal distribution work was completed for all blocks in Zone 1.

A more detailed review provided by the MECA monthly Progress Report, ending March, 1985 showed that for Zone 1, Block 101 D and F Canal work was approximately 50% complete, for Block 102 it was 80% complete, for Block 103 it was 30% complete, and for Block 104A it was 20% complete. A further up-date of work progress made in discussions with MECA staff indicated that D and F canal construction was making very slow progress on the Left Bank to the point that MECA, in early May, 1985 had cancelled 5 of 8 contracts for mechanized construction of D and F Canal distribution systems and was reverting back to small scale labor contracts to complete the work.

Overall, the picture for Zone 1, shows little construction progress has taken place during the first quarter of 1985 for the canal distribution system, buildings and road construction. The opening of the branch canal under the Phase I(a) construction is planned for LB-L1 to open in July, 1985 feeding Block 101, 102

1/ Report - Review of Progress, Mahaweli Basin Development, Phase II, dated July, 1983, by Correl, et.al.

and 103, for LB-L2 to open in August feeding Block 104 and LB-L3 to open in September, 1985 feeding Block 105. It is not expected that the D, F and drainage canal systems will be completed at the time of branch opening. The critical concern is the completion of these systems to meet water availability for the Maha season plantings. The present rate of progress indicates that this will not be totally realized.

For the remaining Zones 2, 3 and 4A in System B the progress of infrastructure development, as of the end of March, 1985, is most discouraging. Construction of D and F canal distribution systems shows only an estimated 10% complete for Zones 2 and 3 and no indication that work has started in Zone 4A. The scheduled opening of the main and branch canals, Phase 1 (b), serving these zones, is October, 1986. It is concluded that the D and F distribution canals and drainage channels will not be in place at that time.

4.1.4 Status of Construction, Main and Branch Canals

4.1.4.1 Background

The background of construction for the AID Phase II project starts with the award of construction to the U.S. joint venture firms of H.B. Zachry Company and Dillingham Construction International (Z/D), on May 10, 1982 for Phase 1 (a) work, consisting of 23.5 km of main canal and 36.0 km of branch canal, at a tender award price of US\$63.1 million. Work started on June 24, 1982 with the completion date for Phase 1 (a) being July, 1984. Another requirement in the contract, subject to penalty, was that the first 2.2 km of the main canal and the first 12.7 km right-side branch canal (LB-RI), of 18.3 km in length, would be completed by September 9, 1983.

The contract also provided an option, which was exercised by MASL on December 30, 1983, for Z/D to be awarded the construction of Phase 1 (b) of System B. This phase consisted of the continuation of construction of the main canal for an additional 29.4 km and construction of 13 branch canals having a total length of 51 kms, at a tender award price of US\$28.8m. Completion of Phase 1 (b) would provide irrigation water for Zones 2, 3 and 4 of the left bank of System B. The combined length of canals to be constructed under Phases 1(a) and 1(b) amounts to 52.9 km of concrete lined main canals and 86.6 km of concrete lined branch canals at a tender award price of US\$91.9m, providing a main and branch canal water delivery system to irrigate a 21,800 hectare area on the Left Bank of System B.

The original work schedule showed that by May, 1983, after one year of work, 44% of the work was to be completed. Actual completion at that time was 14%. Work continued and the schedule for completion was revised several times, with the last revision being made in February, 1985. This schedule, under which the contractor is now operating, calls for the substantial completion of Phase 1(a) by September, 1985, and for the completion of Phase 1(b) by January, 1987. For reasons stated below it is expected that Z/D will meet the September completion schedule for 1(a) and should substantially meet the completion schedule for 1(b), providing current civil strife does not interfere with work operations.

The LB-RI section, which was to be initially completed by September, 1983, was not substantially completed until August, 1984. The completion date had been officially revised by change order to a June 14, 1984 completion date. This element of the construction contract is now subject to a liquidated damage penalty for 61 days over-run of contract time in the amount of US\$ 577,000.

The failure of Z/D to meet planned work schedules are based upon many factors. A few are noted:

1. Early on-the-job management problems experienced by both Z/D and B/I resulted in the replacement of the Z/D Project Manager and the B/I Construction Manager. This replacement resulted in an improvement in job supervision control, job management and job mobilization.
2. Adverse weather conditions due to 82-83 and 83-84 monsoons caused extensive loss of work resulting in approved time extensions of the contract for 225 days.
3. Additional work requirements and unforeseen sub-surface conditions resulted in approved contract time extensions of 44 days.
4. Communal violence and effects of the 1983 civil strife resulted in approved contract time extensions of 10 days.
5. Other claims submitted by the contractor, now pending, are expected to be approved by the B/I CM for an additional 45 to 60 days time extension of the contract.

In summary the Contract construction documents stated that all work would be completed as noted in Table 4.1.

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 Table 4.1: Planned and Actual Construction Completion Dates,
Phase II.

<u>Section</u>	<u>Original Contract Completion Date</u>	<u>Actual Completion Date</u>
LB-RI	September, 1983	August, 1984
Phase 1 (a)	July, 1984	September, 1985 (Planned)
Phase 1 (b)	April, 1986	January, 1987

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As of this evaluation, the revised construction schedules, moving ahead the date for completion of work, are substantially covered by approved change orders increasing contract time.

4.1.4.2 Status of Construction

The present status of construction progress is such that the B/I construction manager is very optimistic that Z/D can meet the present schedule of completing Phase 1 (a) by September, 1985 and Phase 1 (b) by October, 1986. However, it is noted that progress for the months of March and April for Phase 1 (a) totalled only 5.6% compared to a scheduled progress of 8.9% while for Phase 1 (b) progress was 7.1% compared to a scheduled progress of 5.5%. The contractor must sustain progress at the rate of 8 to 10% per month to complete work within the scheduled time.

Z/D is now fully mobilized to carry out the work, with a work force of 2500 people and working 2-10 hr. shifts per day. A second concrete paver for canal lining has arrived at site and is being put into operation; the paving crews are trained; Carsons, the sub-contractor for earthwork, is performing well; Z/D project management has considerably improved and the job lay-out allows for efficient operation. Based upon the short site visit it is felt that Z/D has the resources and management to complete work on schedule.

However, on the negative side of meeting schedule completion is the effect the current civil strife in the area is having on job progress. During the evaluator's two day site visit a civil disturbance caused the immediate shutdown of canal paving operations with the loss of 8 loads of transit mix concrete and the probable removal of some paved sections of the canal. This shutdown will lead to claims by the Contractor and the work loss

will extend over a number of days due to the inability of the contractor to sustain full operation for a number of days thereafter. Delivery of explosives to site has been curtailed by the GSL which will have a direct impact on Z/D proceeding with rock removal in section M-4 of the main canal, a critical section related to the completion of the Phase 1 (a) work.

Other factors, such as the recurrence of adverse monsoon rains or overruns in material excavation, due to unsuitable soil, could again delay work progress and prevent the contractor from meeting scheduled completion. It is concluded that the contractor will substantially complete Phase 1 (a) by September-October, 1985 but that subsequent uncontrolled delays may well extend completion time of Phase 1 (b) past the January, 1987 completion date.

The construction management and quality control of work being exercised by the B/I team over the Z/D operations is very satisfactory. The B/I engineering, inspection and quality control staff consists of 32 personnel of which 8 are expatriates. The Construction Manager is an experienced professional engineer having a strong background in irrigation construction and maintenance work. The construction and the materials engineer have the same qualifications.

The local staff of engineers, technical inspectors and testing personnel are furnished by the Sri Lanka firm of Resources Development Consultants, (RDC) working in Association with the B/I group. The experience and knowledge of RDC personnel was observed to be of very high standards, an example being the construction inspectors, many whom have retired from the Department of Irrigation. MASL does not provide staff to the B/I operation.

The link between B/I and MECA at the field level is the day to day liaison between the MECA Project Office and B/I in the co-ordination of construction activities being done downstream by MECA and of canal work supervised by B/I and constructed by Z/D. The major co-ordinating effort is establishing correct horizontal and vertical controls for D-Canal turnouts off the main and branch canal structure. The relationship between B/I and the project MECA, RPD and Co-ordinating Liaison engineer are quite good. The Client-Contractor relationship between B/I and MASL/Hq is reasonably good. On the MASL/Hq side the B/I Construction Manager reports to the Chairman of MECA/Colombo, who is the Project Director for the Project. Technical and contract administration problems are discussed at MASL/Hq with the Director of Maduru Oya, Left Bank and Right Bank and the Director of System B, of which most discussions are with the Director of the L.B. and R.B.

Overall, construction operations, problems and issues are discussed by the B/I CM with the Ministry of Mahaweli, the System B Advisors and with the Director General, MASL.

Quality control and inspection work operations were observed by the evaluator at a number of work sites. The quality of work being performed by Z/D, especially for canal lining, was of high standards. The testing and inspection being applied throughout the job operation was very adequate. Nuclear density testing equipment was being used for compaction testing, allowing rapid and frequent testing of embankment compaction work. Testing of materials at the lab site was being conducted by the RDC local staff under the supervision of the expatriate materials engineer. Procedures were correct, equipment was adequate and the local staff were very familiar with procedure and testing requirements.

Overall, the job construction operations and applied inspection and testing were noted to be quite adequate. Job relationship between B/I and Z/D were quite satisfactory and co-ordinating activities between B/I and MECA project office was quite good. The problems related to construction operations and job supervision appeared two-fold.

1. The disruption of work and its aftermath related to the current civil strife in the area is presently a major problem for the Contractor in trying to maintain planned work schedules. This is resulting in numerous claims being made by the Contractor against the project.
2. An increased amount of time, by the B/I Construction Manager, is being devoted to responding to Z/D claims. This diverts time from management of the day to day technical and administrative issues of the job. It is a growing problem and one that should be resolved soonest.

4.1.5 Claims and Arbitration

The project loan agreement for Phase II requires USAID approval of a) all changes in construction costs over \$100,000; b) all changes in construction specifications; and c) all change orders approved by MASL. As part of the evaluation a review was made of the past three years claim actions against the project by the contractor Z/D.

Claims are submitted by the contractor to the B/I Construction Manager (CM), who reviews and has the authority to approve claims up to the amount of US\$100,000. Claims above this amount

are submitted by B/I to MASL along with recommendation for approval or disapproval. If approved by MASL the claim is submitted to USAID for approval. If denied, the claim is returned to Z/D with notification of denial.

Any claims denied by MASL may be submitted by Z/D to the Secretary, Ministry of Mahaweli Development for reconsideration of the denial. If the denial is upheld by the Secretary, Z/D may proceed with claim arbitration.

The evaluator, in review and discussions of claim actions with the B/I Construction Manager, noted that up to early May some 18 claims had been submitted by the contractor for approval. Of the 18 submitted, 10 had been settled or approved for payments in the amounts of US\$1.9 million and for contract time extension of 279 days. One claim, for additional clearing and grubbing in the amount of \$267,000 had been denied at the Secretary level and the remaining 7 claims were awaiting further review and action.

At the time of the site visit (May, 1985) a joint venture meeting was underway between executive members of the Zachry Company, Dillingham International, and Z/D site staff. An action resulting from this meeting was the decision by Z/D to proceed with arbitration on a number of claims, including the denied claim for additional clearing and grubbing. At this time Z/D presented to the B/I CM a schedule of proposed claim and arbitration proceedings covering 12 claim items that would be carried out by Z/D over the next 10 months, depending upon claim decision made by the B/I CM, MASL, and the Secretary. Presumably, arbitration action is being exercised by Z/D on the basis of a determination by their legal department that arbitration will result in favourable payment awards to Z/D.

To compound the issue of claims another instance of civil strife took place in the area during the joint venture meeting (see section 4.1.4.2). The shutdown, that day, of the Z/D construction operation led to further claims by the contractor. The magnitude of a one day shutdown is apparent if one considers that the Z/D project overhead cost is estimated by Z/D to run at about \$30,000 a day.

The step-up in claim submission and pending arbitration actions by Z/D has caused the B/I Construction Manager to be spending increased amounts of time addressing claim and arbitration issues, at the expense of the day to day technical and administrative requirements of the project. The situation is not expected to improve over the remaining construction life of the project. To counter this problem, B/I has requested and received

the approval of MASL to add another expatriate to the B/I engineering office field staff for the purpose of assisting the B/I Construction Manager in dealing with the claim problems.

At the time of this visit (May, 1985) steps had been taken to start recruitment for this position. The evaluator pointed out that the position should be filled with a person having considerable past experience in claim and arbitration procedures and does not necessarily require a person with strong background experience in construction work as this will be complimented by the technical skills and experience of the B/I CM. The evaluator strongly recommends that MASL immediately assign a person from MASL/Hq to work on the forthcoming arbitration actions being initiated by Z/D. As arbitration actions are noted to take considerable amounts of time and cost MASL should move to start preparation actions and establish an institutional memory of claim and arbitration proceedings.

Some 25 to 30 claims have now been declared by Z/D (June, 1985) and it is expected that due to subsequent adverse weather conditions and most probably, civil disturbances, the completion of the remainder of Phase 1(a) and the major portion of 1(b) will be the basis of many more claims by the contractor. Additionally, arbitration is expected to be a long drawn-out process that may result in some large payment awards to Z/D. The immediate action by MASL should be to get in command of the situation.

4.1.6 Project Costs and Funding Availability

A review of the project costs and cost projections showed the following status regarding funding requirements and availabilities to complete the work under the Phase I and II projects (see Tables 4.2 and 4.3). Costs and cost projections are based upon amounts contained in the B/I monthly engineering progress reports and as discussed with the B/I CM.

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 Table 4.2: Fund Requirements and Availability, Phase II

US\$ (000)

1. <u>Construction costs for Phase 1(a)</u> <u>and 1(b), to October, 1986</u>	
a) Tender price	91,860
b) Escalation Costs (Oct 86)	2,170
	<hr/>
Sub-total, Base Construction Cost	94,030
c) Change Orders (approved)	1,750
d) Change Orders (estimated)	750
e) Quantity overruns	
1) Paid	4,450
2) Estimated	1,000
	<hr/>
Construction, Total Estimated Cost	101,980
	<hr/>
Rounded :	\$ 102,000
2. <u>Fund Availability</u>	
a) Phase II loan authorization	
1) Committed	85,000
2) Uncommitted	20,000
b) Contribution by GSL (local cost)	1,000
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Total availability	106,000
c) Less estimated construction cost	102,000
d) Uncommitted funds available from Phase II loan authorization	\$ 4,000
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Table 4.3 : Fund Requirements and Availability, Phase I

US\$ (000)

1. Supervision Costs

a) Contract budget costs	
1. Design (actual costs)	2,430
2. Supervision (actual costs)	2,770
b) Supervision cost increase to July, 1986	1,650
c) Supervision, projected cost increases, August, 1986 to May, 1987	600
d) Supervision and claim arbitration projected cost increases (unforeseen)	500
	\$ 8,000

2. Funds Availability

a) Phase I Loan Authorization	9,600
b) Less estimated costs	8,000
c) Uncommitted availability of funds from the Phase I authorization	\$ 1,600

(Above supervision costs do not include local cost support being provided by the GSL under the loan agreement).

The above analysis shows that if the October, 1986 construction schedule is met, total project costs are expected to be within the funding availability of the Phase I and II loan authorizations.

A more pragmatic approach indicates the Z/D construction operations will be subject to additional delays, with cost implications, due to reasons mentioned above. Additionally, initiated Z/D claims and arbitration proceedings are expected to result in some settlements favourable to the Contractor. Additional delays translate into claims, time extensions and

extension of engineering supervision time, all of which increase project costs. Other than arbitration settlements, these increased project costs are not expected to exceed funds available under the Phase I and II loan authorizations.

4.1.7

Pilot Area Irrigation Model

The scope of work for B/I, under the Phase I Design contract, required B/I to design a D and F canal distribution system and on-farm works, including drainage, for two sample areas in System B, having an aggregate area of about 4000 hectares. B/I services also included the layout and construction supervision of the irrigation and drainage tertiary system for about 300 hectares of this 4000 hectares sample area at the time of construction. This layout was to represent the model layout of the field channels, drainage systems, and field bunds for system settlers and would in turn be replicated throughout the L.B. of system B. B/I was to prepare tender documents and make them available to MASL not later than June 30, 1981. The documents would then be made available to prequalified local contractors who would tender for the construction of the model layout.

The subsequent history of the implementation of this activity shows long delays taking place between each step in the tender package preparation by B/I and subsequent approval by MASL. As of May 1, 1985, the process has only reached the point of prequalification of contractors. Projections shows that one more year may be required to go to tender and award the work.

The concept of a model field layout has long ago been lost as field layouts have taken place over the past 3 years and continue to take place in System B. For MASL to proceed with contracting for the construction of the model layout may have advantages. However, considering that construction may not take place until late 1985 and may take one or more years to complete it is concluded that a review of this activity should be made to determine the advantages and disadvantages of proceeding with the construction of the pilot area under B/I supervision and if proceeding with construction will result in increased costs to the B/I contract.

4.1.8

Operation and Maintenance Program

In September, 1985 the LB R-1 Branch Canal facilities will be turned over to MEA by the US Contractor, Zachry/ Dillingham, and MEA will assume maintenance of the facility. This will be followed in February, 1987 by turn-over of the remainder Phase 1 (a) system and in June 1987 of the 1(b) system to MEA. At this time MEA in System B will have operating and maintenance

responsibility for 140 kms of concrete lined canals and the attached network of 2300 kms of D, SD, field distribution canals and drainage channels.

Based upon observation made during this evaluation it is unlikely that the planning, budgeting and fund release by MASL for operations and maintenance will be sufficient to meet the system's requirements. This is further emphasized when noting that the amounts budgeted by MEA for the five year financial plan for O/M in System B (1985-1989) amounts to Rs. 1.0m (US\$37,000) in 1985, Rs. 2.5m in 1986 (US\$93,000) and Rs. 4.75m (US\$176,000) in 1987, not including the cost of new equipment. These are unrealistic requirements relative to the size and composition of the system. As a guide, annual maintenance funding requirements could be estimated at 1/2% per year of invested cost. This would require levels of Rs 20.0m (US\$700,000) to Rs 27.0m (US\$1.0m) a year to be budgeted and funded for maintenance needs, which is very unlikely to happen.

However, the prospects for the follow-on maintenance program for System B may be improved as funds have been provided under the Phase II project for procurement of O/M equipment (US\$2.0m) which is complemented by a grant of US\$2.3m to provide technical assistance to MEA in developing and implementing an O/M program in System B. This technical assistance program started in May, 1985 and will run for a two year period to May, 1987.

The U.S. firm of CH2M Hill International have been awarded the contract to provide the services to equip, train and put in place an organization in System B to assume and carry out the responsibilities of the operation and maintenance of the Left Bank irrigation canal system. This technical assistance program is the first instance under the AID sector and Phase I and II projects where funds are being utilized for technical assistance to assist in the institutional building of a MASL entity.

Overall, the resources of technical assistance, funds, and the existing MEA field organization are in place to develop a viable O/M program for System B. Increased local cost funding levels for subsequent year O/M operation will be the major issue in future. Development and implementation of the O/M program should place attention and priority on the necessity of receiving adequate O/M funds.

4.1.9

Project Monitoring and Reporting

4.1.9.1 USAID

The monitoring and reporting of activities generated under the Phase I and II Projects is the responsibility of the USAID office of Mahaweli and Water Resource Development (USAID/MWRD). The office provides engineering support for the mission and is staffed with highly trained and experienced professional engineers and water management officers. Four of the staff are direct hire AID employees, one of which is the office chief, supported by a local staff of 6 employees of of which one is a highly qualified engineer.

The Project Manager for the Phase I and II projects, and AID direct hire engineer, has extensive background experience in irrigation system design, construction, maintenance and management. He is supported in project monitoring by two of the local staff with overview supervision by the MWRD office chief. The Project Manager visits the project site at least once a month, and when issues arise, on a more frequent basis. The Project Manager was noted to have extensive contact with key MASL staff both in Colombo and in the field and was thoroughly familiar with the MECA and MEA organisational structure and how it functioned. The Project Manager has worked in Sri Lanka for the past six years and is very knowledgeable about the country and conditions therein.

The degree and extent of monitoring and reporting of project activities by MWRD was noted to vary in relation to the activity. MWRD, makes a detailed review of the Z/D monthly progress payments originating from the field, gets closely involved in the Z/D construction operations, monitors quality control and is very aware of field construction problems. However, ~~written reports of inspections, field problems, project issues, financial concerns and meetings with MASL officials are practically non-existent.~~ The last USAID field inspection report noted was dated April 3-6, 1984. In view of the complexities and problems related to the present Phase I and II project activities, some of which are expected to result in subsequent AID financial involvement, reporting procedures are presently negligent.

The monitoring by MWRD of the progress of the downstream infrastructure development being financed by the GSL FOR Zones 1,5,2,3 and 4A appeared to be of low priority as no reports were noted that related the progress and problems of this activity to the progress and problems of the Phase II program. Overall, the Project Manager and MWRD staff are extremely capable and have the capacity to perform project monitoring requirements, prepare related reports, and relate total System B activities to the Phase I and II project purpose. Only part of these activities are presently being performed.

4.1.9.2 MASL

Comments relating to the monitoring and reporting of Phase II project activities by MASL will be limited to the format and content of the monthly Engineering Progress Report prepared by B/I for its client, MASL.

The monthly progress report is distributed to USAID and MASL and its purpose is to provide a current monthly account of project activities, construction progress or lack thereof, problems, claims, progress payment, project financial status and other descriptive accounts of total project activities in a decisive manner.

The present report format and content does not meet this purpose. The USAID project manager should discuss the project reporting format with the MECA Director of Left and Right Bank System B and with B/I at the project site. The format should follow the guidelines for preparing progress reports as found in AID Manual, Order No. 1263.1, Annex A, Attach L, Page L1-L4. Trans Letter No. 11:12, effective date Sept 30, 1962, applicable to Capital project construction activities. A copy of this is available in the USAID/MWRD office.

4.2 Mahaweli Sector Support Loan

4.2.1 Evaluation Criteria and Procedure

The evaluation undertaken of the Mahaweli Sector Support project is an end-of-project evaluation. This section of the report, addressing infrastructure development, will evaluate end-of-project-status conditions based upon the following criteria:

- (a) Was the assistance of local cost support effective in helping to meet AMP planned targets of downstream infrastructure development during life of project.
- (b) Did the GSL undertake adequate planning, timely implementation and follow-on maintenance of downstream infrastructure development in utilizing project funds.

- (c) Did the contributions of local currency allow the GSL to maintain adequate levels of funding for downstream infrastructure development as planned in the project.
- (d) Did the GSL and USAID exercise adequate monitoring and reporting of project output activities.

In carrying out this evaluation the team a) held discussions with MASL officials at Colombo Headquarters, b) reviewed appropriate documents and reports of both MASL and USAID, c) conducted on-site inspections of completed and on-going infrastructure development within System H,C,B, the Transbasin Canal System and connecting road networks; and, d) conferred with MASL officials at the field level during site inspections.

4.2.2 Effectiveness of Local Cost Support

The effectiveness of local cost support in meeting planned targets of infrastructure development is dependent upon linking planned activities with funding availability and determining how efficiently activities are being implemented. A secondary factor relates to the quality of the completed activity. From the MASL annual program of target expenditure for the project (proposed table of allocation of rupees for target activities) the evaluator selected specific activities for inspection to determine the quality of construction and implementation mode.

A major facility inspected was the Minipe Anicut and Transbasin Canal, which will provide 60% of the water requirements to System B. The Sector Support Project contributed approximately Rs. 263 million of local cost (some 20% of the sector support loan) towards the construction of this facility. The Transbasin Canal was constructed by an international firm (Italian) under contract with MASL and completed in 1983 at a reported cost in excess of Rs. 1,000 million. The 30.8 kms of Transbasin Canal were of excellent workmanship, and showed an overall quality one would find in the U.S.A. No major defects were noted in the quality of work.

Another major area of expenditure under sector support has been road construction. Reimbursement for road construction is estimated to be approximately Rs.120 million (some 10% of the sector loan). The evaluator inspected road and bridge construction in the Kotmale and Victoria Reservoir areas, inspected two of the MARD/ADB road projects being constructed between Systems C and B and inspected a number of small road construction projects underway in Systems H and C.

Overall, the evaluator found the quality and progress of road construction work to be sub-standard. Factors which contributed to this sub-standard road construction are the lack of embankment and subgrade compaction and the lack of grade line control of the finished sub-grade prior to placing sub-base on base materials. This was noted in all cases except for the MARD/ADB roads being constructed between Systems C and B.

Road projects in the Kotmale and Victoria area are being built by the GSL parastatal firms RVDB and SDCC under contracts awarded by MASL. These contracts are in effect, open-ended construction contracts with no liquidated damage enforcement. The projects were of poor construction quality and the contracts had large time overruns. A review of the construction specifications for the Kotmale and Victoria road projects showed that compaction is required but that the requirement is seldom enforced. The evaluator attempted, from discussions with DOH and CECB representatives, to determine how time overruns were affecting construction cost increases on the projects. No satisfactory answer was forthcoming, other than the statement that costs did not increase with time overruns. This was questionable in view of some projects being overrun as much as 1 1/2 years in contract time. Thus, in the above cases local cost support has been effectively used in the construction of the Transbasin Canal facilities and only marginally effective in road construction.

It was not possible to identify specific rupee allocation activities among the other facilities inspected in Systems H and C. However the quality of work and the contracting mode could be evaluated. In System H a recently completed hospital facility for a 20 bed complex at the town of Thambuttegama, was inspected. The construction was of excellent workmanship and the facility was awaiting acceptance by the Ministry of Health. Other work underway in the complex, consisting of the hospital operating room facilities, showed good quality construction and workmanship.

In System C the evaluator inspected a central concrete casting site for D-Canal turnout structures. Here central casting for concrete canal turnout boxes, plates and drop boxes were being cast under controlled and quality control conditions. The cast units were excellent in shape, quality and finish. This method of central casting was being applied throughout C and is to be applied in System B. Field assembly and installation of these units was observed. The in-place structure showed a high quality functional unit ready for use.

In general, construction contracts are not being completed on time due to unrealistic planning for working time coupled with low production output of local contractors. Once completed the quality of the structures was generally quite satisfactory,

except in the noted case of road construction. However, observations made by other members of the evaluation team indicate that some buildings and irrigation facilities have suffered from shoddy workmanship and have already begun to deteriorate due to lack of maintenance. This has resulted in greater than expected costs and unrealistic budget planning, with adverse repercussions for the overall efficiency of construction management. Thus, while the sector support funds have contributed to achieving planned levels of construction, poor MASL management of contracts may have reduced the efficiency of fund utilization. This, coupled with inadequate maintenance, could undermine the structure s useful life.

4.2.3

Planning and Budgeting

The planning aspect of identifying construction and maintenance activities to be performed under the systems development and operation rests with the MECA/RPD for construction activities and the MEA/DRPM (Water Management) for operation and maintenance activities. This total planning and budgeting exercise, which is performed on an annual basis usually starts in the third quarter of the fiscal year (July-Sept) at the project level.

For MECA the exercise starts with the RPD preparing the plan and budget based upon:

- (a) New construction activities planned for the System by MECA/Hq.
- (b) Availability of Project and Divisional level staff and staff work-load.
- (c) The infrastructure needs of the Project as identified by the MEA Resident Project Manager.
- (d) Funding (target level) that will be made available to the project by MASL for the forthcoming F.Y.
- (e) The level of on-going construction carry-over into the next fiscal year.

During the planning exercise the RPD is in continual discussions with his staff (DRE s), the Project RPM, and MECA/Hq. staff.

The budget is prepared based upon:

- (a) funding required for on-going contracts carry-over, (uncompleted work),
- (b) funds required to cover outstanding contract retention and progress payments; and
- (c) funds required to cover costs of new construction start-up planned for the year.

All of the above are then reviewed at project and headquarters level, agreed upon and submitted for the final approval of MASL. It was stated that no plan or budget submitted to MASL for final approval had ever been cut below the requested funding level for the proposed fiscal year program.

For the MEA the planning and budgeting of the annual maintenance program is the responsibility of the Deputy Resident Project Manager (DRPM) (Water Management).

The DRPM works closely with the Block level Irrigation Engineer (IE) and his staff identify maintenance requirements within each Block of the Project and estimate the cost of carrying out these activities. Each Block's requirements are consolidated into one maintenance plan and budget for the project and submitted to MASL/Hq. for approval.

The planning and budget preparation should start by September or October of the year with requirements based upon a maintenance frequency schedule for certain items such as canal desilting, grass cutting, road resurfacing and building maintenance. This frequency seems to depend upon the project location and the experience of the DRPM (Water Management) assigned to the project.

Frequencies appear to be based upon a two year cycle of maintenance. As an example, a two year cycle is used for canal desilting whereby 50% of the canal system is planned for desilting each year, or for road regravelling where 50% of the system gravel surface roads are planned to be regravelled each year. Building painting is also done on a frequency basis but the planned frequency and timing was not specified.

Other non-frequency maintenance activities are identified within the Block area such as canal slope rip rapping, field channel

grade improvements and other items, all for inclusion in the annual maintenance program. These activities are quantified at the Block level, and costed out based upon a Bill of Quantities list (BOQ) and unit prices established by MASL/Hq for field work. As an example the 1985 unit price for growth cutting along canals is Rs. 330 per acre.

The work of identification of activities, quantification, and costing is usually carried out by the Engineering Assistants and Technical Officers at the Block level. This staff, in turn, has the subsequent responsibility of implementing the approved program. The identified activities and costs are submitted by the Block IEs to the DRPM where consolidation of the Block maintenance programs for the project takes place. The proposed maintenance program prior to submission to MASL is discussed and agreed upon between the DRPM, the RPM, Block IEs, and Project Coordinator. It was stated to the evaluator that no O/M budget, once officially submitted, had been revised or cut at the MEA/Hq level.

Overall, the planning and budgeting of construction and maintenance activities appears to be realistic in scope and purpose with the major constraint being the inability to effectively implement the approved planned activities. This constraint leads to a continual shortfall in the expenditure of approved funds and not completing planned target activities.

4.2.4 Implementation

The failure to implement planned construction and maintenance activities on a scheduled and timely basis is the major constraint of downstream infrastructure development in the AMP.

4.2.4.1 MECA

For the MECA, implementation of planned construction proceeds on the basis of the approved program. The responsible levels of design, contract preparation, contracting, award and payment are:

MECA/Hq. prepares the design, final BOQ costs, tenders, awards and makes payment for all contracts over Rs.300,000. Under special approval of MECA/Hq. the RPD can prepare, award and make payment on contracts from Rs.300,000 to Rs. 1.0 million. The RPD has the responsibility to administer all contracts, usually through the Divisional Resident Engineer (DRE) at the Divisional level.

The major contracting responsibility at the Project level is the preparation and award of contracts in value up to Rs. 1,00,000 called Small Scale Contracts (SSC). These contracts are usually prepared at the Divisional level by the Divisional Engineer and his staff and award is made by the RPD at the project level. Administration, measurement and payments are made at the Divisional level including final payment for work completed.

Small Scale Contracts are negotiated directly with the contractor by the RPD based upon a Bill of Quantities (BOQ) and a MASL established unit price. Contract price is usually established at the unit price cost and in all cases MECA supplies the material for construction to the Contractor.

The number of small scale contracts underway in the Systems at any one time is a formidable figure. The evaluator was told that in System C, Zone 4 (South) over 250 SSC were presently underway (May 1985) along with 15 medium scale contracts (Rs. 300,000 to 2.0 million) and 180 large scale contracts (over Rs. 2.0 million).

The main thrust of construction implementation is carried out at the Divisional level by the Divisional Resident Engineer (DRE) and his staff. As an example, System C is divided into three Divisions for construction implementation. For Division operations in Zone 4 (South) the DRE has a staff of 4-Resident Engineers, 1-Office Engineer, 1-Building Works Resident Engineer, 8 -Project Engineers, 16-Engineer Assistants and 40-Technical Officers. The construction budget for the Division amounts to Rs. 312 million and SSC were being disbursed at the rate of Rs. 5.0 million per month.

The DRE stated that the schedule of contracts and disbursements was on target and being implemented at the level of 90% planned activities. The DRE stated that the major problems related to SSC was the paper work associated with administration for such small values and the requirement that MECA provide all materials for the undertaking of the work.

It was stated by the RPD (System C) that it has been proposed to reduce the number of SSC by packaging a number of SSC under one contract, especially for land levelling, jungle clearing, D-canal construction and road construction. This proposal remains to be carried out by MASL and could present a problem in the amount of time required to award the contract and mobilize the Contractor, as possibly up to one year would be required for these actions. SSC do have the advantage of award and start of work within a few

days time.

The inspection of work, measurement of quantities and preparation of payment vouchers for SSC is usually the responsibility of the Engineering Assistants (EA) and the Technical Officer (TO) on the Division staff. Monthly and final payment of work is made at the Division office. In considering the number of SSC to administer in any system and the number of available Divisional level staff it was quite apparent that limited supervision and inspection of construction work could take place.

4.2.4.2 MEA

The implementation of approved maintenance activities at the MEA Project level is usually carried out at Block level by the Irrigation Engineer with the majority of work being done by small scale contracts (SSC). The award and administration of small scale contracts by MEA differs markedly in procedure than that used by the MECA. MEA can only award contracts to contractors who have the approval of the member of parliament of the represented project area. It was stated that the number of Contractors approved for areas has been limited such that only a small number are available to tender in any one area and that due to this limitation one Contractor may have as many as 10-15 SSC to start and complete during the year.

The Project RPM has SS Contracting Authority up to the level of Rs. 500,000. Contracts over Rs. 500,000 are awarded at MEA/Hq and administered in the field by the Project. The SSC cost estimate is made at the Block level by the EA based upon the BOQ and established unit price, and contracts are awarded at the RPM level on the basis of competitive tender and not by negotiation. The evaluator noted tender awards made for SSC where the award amount was 50% below the cost estimate. Such low prices result in the non-performance by Contractors, which was stated to be a major problem associated with small scale contracting.

Maintenance activities, such as canal desilting are carried out under present MEA practice during the canal closed season prior to Yala and Maha planting. With canal closure the Block IE's staff (EAs) must make measurements for silt quantity removal, translate that into a cost estimate, award the required SS Contracts, have the work completed, make final measurements and prepare payments, all within a 60 to 100 day period; an almost impossible task. If weather problems develop, such as happened during the 84-85 monsoon season, closure may be only for 30 to 40 days with the resultant loss of maintenance. These requirements result in a peak maintenance work load during the closed season.

Other maintenance activities consist of MEA force account gangs performing maintenance of hard to quantify items, such as repair of structures at field turnouts, minor building repair, bund maintenance and other items that cannot be readily translated into an SSC or are of an emergency nature.

Additionally, the vast network of gravel surfaced access roads within the project area require mechanized grading at least once a year and preferably twice a year, corresponding to the Yala and Maha rains. The evaluator was told that each Project has an assigned grader, coming from the Mechanical Division at Project or System level, but that equipment deadline conditions severely limit the availability of this grader. The evaluator noted some rather bad road surface and road drainage conditions in the Blocks. It is also questionable that one grader per Project, even in top working condition, is sufficient to provide the required road surface blading for the size of the road network within the Project area.

Overall, the evaluator notes that the organizational structure of the MECA and the MEA places the major share of the Project work load for the implementation of construction and maintenance activities on the MECA Divisional level for construction and the MEA Block level for maintenance. As an example the staff level noted for System C, Zone 4 (South) shows 138 technical personnel to carry out a Rs. 312 million construction program for 1985. Of this staff 26 are EAs and 71 are TOs. Relating this to the number of active contracts planned for 1985, some 445, of which 250 are SSC, it is questionable if adequate attention can be given to effective contract management for the magnitude of this program.

Additionally, the evaluator noted the continual problem of insufficient transport being available to allow monitoring and inspection of construction and maintenance activities by the staff. The evaluator was told that this is further exacerbated by an Administrative restriction setting a monthly travel allowance, at field level, of 300 miles a month. This, along with the administrative and documentation problems associated with implementation of the multitude of small scale contracts results in an unmanageable implementation situation. The MEA O/M Block staff experience similar problems and restrictions especially during peak load maintenance activities.

4.2.5

Maintenance

Follow-on maintenance activities, appear to be given a low priority throughout the systems visited. At System H, it was noted that the O/M activities and budget approvals for 1985 consisted, largely, of capital improvement activities to be

carried out during the year by the DRPM (Water Management) and his Block level staff. For the Galnewa Area, the 1985 approved work program showed that of Rs. 25.8 million budgeted approximately 75%, or Rs. 19.0 million, was for capital improvement activities. These activities are for Unit Manager house construction, road construction, day care centers, etc. Observation in System C and B showed similar proportions of the O/M budget going for capital improvements. The conclusion reached is that the systems are going through a consolidation phase to put-in-place as many new facilities as possible within the levels of funding presently available. The maintenance budget then becomes secondary to the capital improvements being carried out in the project area.

The evaluator inspected maintenance activities such as secondary growth cutting of D-Canal slopes, pot hole repair of service roads, rip rap placement on tank slopes, masonry wall construction for a field channel, field channel grade improvement, culvert repair on a market road (this maintenance would be the responsibility of the DOH when the road facility is turned over to the DOH). The evaluator also inspected, at two sites, the downstream maintenance condition of field channels both above and below turnouts. Of the activities inspected, the evaluator was quite satisfied with the quality of finished work. The problem appeared to be that insufficient maintenance activities are being carried out to meet the System needs.

Inspections were made in System C of the condition of office buildings, staff housing and other structures that have been completed over the past 3 years.

At Branch Canal 2, Block 3, under first season water operations, heavy secondary growth of weeds and grass was evident in the canal. The evaluator was told this canal was still under MECA control and would be taken over by MEA in November for the coming Maha season. MECA does not have access to maintenance funds so it was implied that hand over to the MEA may take place without growth cutting being done or the canal cleaned.

The evaluator looked at a grade II staff quarters which was in a very bad state of repair and unoccupied. The evaluator was told that this building was vandalized after completion, when under MECA control, and prior to handover to MEA. This raised the question of transfer procedures established between MECA and MEA for take-over of completed facilities. It appeared that no set procedures have been established in the Systems to account for maintenance requirements and building security during this transitional period when completed facilities are under MECA control prior to hand-over to MEA.

Further inspections of buildings in the Hamlet Centre of Galporuyaya showed building maintenance generally to be of low standard. Inspection of the Block Manager office (Block 3) showed a need for window repair, wall repair and other minor work. The impression that remained with the evaluator was that although no major repair work was necessary for the buildings inspected there was a look of a first stage run-down condition for most of the buildings.

The reverse of this situation was evident in the inspection of the Block Manager office, Bathalayaya, Block 1 where the Agriculture Training Centre building was being used as the Block office. The building was in excellent condition and in a good state of repair.

A subsequent review of the 1985 building maintenance budget for System C showed that Rs. 449,000 had been approved for this purpose out of which Rs. 108,000 had been approved for Block 3 use. Status of availability of funds was not known.

Overall, the maintenance conditions in the systems visited contrasted greatly. The evaluator noted many completed maintenance activities for tank and canal slope sections where the finished work was of high quality. However, buildings were generally not being maintained and buildings that were in good condition were the exception. Field channel maintenance was again variable as to quality and extent. Of three sites inspected, two were in excellent condition and the third was in very bad condition. From condition reports made by the other members of the evaluation team and from past reports of maintenance inspections by other donor organizations, it is the general consensus that irrigation system maintenance and building maintenance activities in the systems are of low priority and not being performed at a level to provide minimum standard requirements.

These conditions reflect the budget levels allocated to maintenance activities, they reflect the O/M resources being channeled into capital improvement activities, and they reflect the failure of MASL to establish maintenance standards and a serious program for maintenance.

4.2.6

Reporting and Monitoring

4.2.6.1 USAID

The monitoring requirement by USAID for the project as contained in Annex 1, Paragraph D, Implementation, of the Sector Support Project Agreement stated that AID will monitor the implementation of the program by periodic visits to the site of the activities listed within the USAID approved Annual Allocation Rupee Table.

Review of USAID project files show that the project agreement was signed on May 29, 1981 and the first claim for reimbursement approved by the USAID Director on Jan 22, 1982. However, USAID did not commence site visits until June, 1982. From June, 1982 until the time of this evaluation (May, 1985) the USAID office of Mahaweli and Water Resources Development (MWRD) has continued to monitor and report on site activities on a periodic basis. The project agreement annex was clear in the intent that monitoring should be carried out at the site of the activity, and that the monitoring and reporting by the USAID/MWRD office met this intent.

4.2.6.2 MASL

The reporting within the MASL organization is centered with the Planning and Monitoring Unit (PMU) at MASL/Hq. This unit publishes on a monthly quarterly and annual basis detailed reports of construction activities for downstream infrastructure development. However, the evaluator, after noting the major problems related to implementation of construction and maintenance activities at field level, did not find a MASL reporting document which provided 'hard fact' management and decision making data for use by MASL/Hq and Project level managers. The evaluator was told that the closest document of this type is the PMU published management briefs which have limited distribution within MASL, none of which were available for review.

5. AGRICULTURAL DEVELOPMENT IN SYSTEMS H, C AND B

5.1 Summary of Agricultural Objectives

The expected outputs resulting from the broad array of technical and physical inputs were :

- (1) 2 1/2 acre irrigated farms with the necessary levelling, bunding, field channels, and distributory channels properly aligned with branch and main canals to provide water for profitable levels of crop production.
- (2) A drainage system to assure proper onward flow of surplus water and prevent water logging and the possible build-up of toxic elements in the soil.
- (3) A half or one acre homestead site generally not to be irrigated but suitable for perennial tree crops and Maha season vegetable and other field crops. In some cases supplemental irrigation from homestead wells or other sources may allow short season crops in the Yala season. In addition to being a home site and area for small livestock enterprises, it should provide crops for nutritional and dietary supplements for the household.
- (4) Increased agricultural production from both crop and livestock enterprises.
- (5) A prosperous rural society whose demand for consumer goods and production inputs will increase local manufacturing investment and employment and act as a spur to national economic growth.

An evaluation of these anticipated outputs follows.

5.2 Characteristics of the Farming System

5.2.1 Settlement Development

Project plans call for the development of totally irrigated, diversified, fully integrated, intensive farms. Settlers on these farms will constitute a part of communities that will have

attractive commercial and social services as well as marketing and processing facilities for local agricultural products. All agricultural technical and training services will be provided by the MASL or, subsequently, the line agencies.

The present Mahaweli area farm can be best described as a 3 acre, partially irrigated holding heavily dependent on paddy culture as a means of subsistence. To date 38,092 farm families have been settled on 1/2 acre unirrigated homesteads and have, or will receive in 1985, a 2 1/2 acre irrigated "paddy" plot (see Table 5.1) 1/. The irrigated plots are generally within a 1 mile radius of the hamlets and villages in which the homesteads are concentrated. An exception to this configuration can be found in System C, Zone 2. Here, because of the abundance of high ground in the zone, the homesteads are 1 acre in size. Plans have been discussed for the alienation of 5 acre livestock farms in hill areas.

5.2.2

Cropping Areas

The development goal is to have all irrigated plots suitable for cropping in both the Maha and the Yala seasons and thus to achieve a 180% cropping intensity. System H, the most developed of the three systems, had a 90% cropping intensity in the Maha '84/'85 season and a 60% to 70% cropping intensity is anticipated in Yala '85. Cropping intensities in Systems C and B are difficult to estimate because they are still undergoing development and the availability of water is changing. On settled plots 80% intensity in Maha and 70% in Yala is a reasonable estimate. The extents of both paddy and other crops in all three systems for the past Maha '84/'85 season is reported to have been 88,656 acres (PMU data). The extents of these crops cultivated in the three systems in the current Yala '85 season can be estimated to be 66,240 acres. This gives an estimated total of 154,896 acres cultivated in the two seasons.

5.2.3

Livestock Activities

Livestock is secondary to crop production in the Mahaweli Projects. The MASL land development programs and intensified agriculture have reduced the area available for grazing so that only confined livestock enterprises are appropriate. Such intensive husbandry is a departure from the extensive cattle and

1/. This figure does not include settlers who have only been allotted unirrigated homestead plots and who are not entitled to irrigated paddy plots. The total number of settlers can be found in Table 6.1.

Table 5.1: Number of Farm Families with "Paddy" Plots and Area of Farm Plots in Systems H, C and B

System	Project Farm Families with Irrigated Plots (No.)	Projected Acres in "Paddy" Plots 1) (Acres)	Projected acres in Homesteads 2) (Acres)	Families with both "Paddy" Plots and Homesteads settled to date (No.)	To Date 1.5.85	
					"Paddy" Plot 1) (Acres)	Homestead 2) (Acres)
H	23,112	57,780	11,556	23,112	57,780	11,556
C	19,945	49,863	9,973	7,581	18,952	3,790
B	21,705	54,625	10,853	7,399	18,498	3,699
TOTAL	64,762	161,906	32,382	38,092	95,230	19,045

Note: This does not include settlers on homestead only plots (cf. Table 6.1)

Source: H - RPM's offices Galnewa, Thambuttegama and Nochchiyagama, April 1985

C - DRPM Lands, 18 May 1985

B - Land officer, System B, 20 May 1985

1) Estimated by : Number of Farm Families with irrigated plots x 2.5 acres.

2) Estimated by : Number of Farm Families with irrigated plots x .5 acres.

buffalo operations which existed previously and the few extensive operations which remain are gradually disappearing due to lack of range. There appears to have been a major reduction in cattle numbers, although new surveys are necessary to arrive at an accurate count. A Draft and Dairy Development (DDD) Program survey indicates that there are 10,218 head of cattle and 10,795 head of buffalo in System H. Surveys are now being conducted in System C to determine cattle and buffalo numbers there.

Poultry, swine and goats are minor enterprises in the area although poultry and bees are being promoted by the Authority and the DDD Program has goat breeding stocks available.

The DDD is the major livestock program of the Mahaweli Authority. Under this program Sahiwal and Tharparpar (White Sindi) cattle have been imported for both milk and draft and Hariana have been imported for draft. Stud bulls are maintained at convenient sites in the systems while the main breeding herds are maintained at Niraviya in System H, Girandurukotte in System C and Poonanai in System B. Veterinary and animal husbandry extension services are also provided for livestock owners. The program has provided over 500 head of draft and dairy stock to farmers since its initiation by the Mahaweli Authority.

5.2.4

Fisheries Activities

The Fisheries Department has stocked the large tanks and reservoirs of the AMP area. As a result the tanks are a major source of animal protein for the region. The Fisheries Department has a technical service to assist farmers with small pond fish culture, but this service has not been particularly active in the project area. The Department is currently conducting a survey and having discussions with Mahaweli Officials to develop new projects useful to the new settlers. Increased small pond and tank fish culture could be promoted as a source of improved nutrition and supplementary income, although it will be necessary to determine how many of these ponds and tanks go dry in the dry season. It will also be necessary to assess the effect of agro-chemical pollution on fisheries development. It is understood that there are early indications that such pollution may present a problem in the Mahaweli area.

5.3 Evaluation of Provisions of Anticipated Inputs for Agricultural Development

5.3.1 Distributory and Field Canals

Distributory (D) and Field (F) canals link the main and branch canals, described in the engineering chapter (Chapter 4), to irrigated plots for on-farm water application. Although the irrigation system is generally well designed, delays in water availability have required many farmers to wait two years and more before irrigated cultivation of their farms. Farmers have then faced further delays while awaiting the proper alignment of D and F canals before all turnouts could have reliable water. A few farmers have been flooded out due to faulty alignment of D and F canals. These problems are still evident in Systems C and B and to a lesser extent in System H where many corrections have been made. Minor mislocations have been corrected by farmers while major faults have been the responsibility of MEA or MECA.

System H has made excellent progress in improving water deliveries in Maha '84/'85 and in plans for Yala '85. Even though only half of the Galnewa Project area can be irrigated in Yala '85, provision has been made for all farmers to farm 1 1/4 acres. Considering past allocations, this is a fairer distribution for Thambuttegama (H4) and Nochchiyagama (H5) whose farmers will be able to irrigate nearly all of their land in a Yala season for the first time since settlement began in those areas. Rough spots are being worked out in Zones 2 and 3 of System C, while Zone 4 is still awaiting irrigation water to be available. Some settlers in Zone 4 have been waiting since 1983 for irrigation water. In System B Zones 5 and 1 are working out problems but it is highly likely that many settlers in Zone 1 will pass another Maha season without irrigation water (cf. section 4.2.3). Settlement in Zone 2 of System B has only just begun, but it is unlikely that D and F canal construction will be completed in time for a Maha '86 irrigation delivery. As will be discussed below in section 5.4.1 and also in Chapter 6, delays between the arrival of settlers and the availability of reliable water supplies have been an important contributor to farmers' inability to achieve greater than subsistence incomes.

5.3.2 Land Clearing and Rough Levelling

Clearing and levelling of the 2 1/2 acre irrigated plots are undertaken by the Authority in all systems. This assistance is particularly needed in System B where there is heavy jungle and a more uneven terrain. These activities, which are essential prior to further development and takeover of the land by new settlers, have generally been accomplished in a timely fashion. Rough levelling is undertaken to the extent necessary for contour

making and bund building. This is sufficient to enable farmers to do the more precise levelling necessary for good crop production. However, the final levelling can only be accomplished after bunds are in place, water is available, and the initial land preparation is completed. In difficult cases it may take several seasons to attain precise levelling in a plot.

5.3.3 Bund Building and Initial Land Preparation

The MEA provides Rs. 800.00 per acre to each settler for bund building and assists with the marking for placement of the bunds. MEA also does the initial land preparation with four wheel tractors. The use of tractors enables a quicker and more thorough completion of a difficult task, which would otherwise have to be accomplished by hand or bullock.

5.3.4 Irrigation Works Operation and Maintenance

Main and branch canals are operated by the Authority while D and F canals are operated by a coalition of Block Engineers, Unit Managers and farmer representatives. Farmers, through their turnout groups, undertake F canal and drain maintenance and, in a few cases in System H, have obtained contracts from MEA to assist with D canal maintenance. It must be emphasised that greater farmer responsibility for D and F canal operations will be essential for the future effectiveness of the irrigation system. It is a matter of some concern that policies for improved farmer participation and strong encouragement for their implementation from top management were not evident from our survey (cf. discussion in section 5.4.1, below).

5.3.5 Forestry and Environmental Management

Erosion, water logging, build-up of chemical and soil toxicity, drainage, and forest land degradation are all potentially serious problems. Close monitoring of these environmental factors must be routinely undertaken to keep these potentially serious problems within manageable bounds. With the possible exception of reforestation not enough is currently being done. Government and donors must pay close attention to these problem areas and be ready to provide necessary resources to control them.

5.3.5.1 Forest Management and Fuelwood

While clear cutting was practiced in System H and in much of System C, methods which will afford better protection to the

environment are being used in System B. The consequences of clear cutting are evident in System H where both lumber and fuelwood are already in short supply and even with reforestation will continue to be a problem for the foreseeable future. Among the consequences of this shortage is the curtailment of the activities of carpenters and cabinet makers because of a lack of wood. In System B and part of System C the Timber Corporation has harvested the trees suitable for lumber while leaving trees where settlements are to be located. Systems C and B have not yet experienced a shortage of wood for fuel and carpentry and there may still be time for sufficient planting of fast growing lumber and fuelwood species to prevent such shortages from developing.

Important contributions to reforestation/^{are}being made by both the Mahaweli Authority and the Forest Department. Out of 117,000 acres of forest land covering Systems H, B, C and D in 1980, only 4800 acres were classed as being of medium productivity or better. The reforestation program has already established 42,000 acres of improved forest in these areas.

The Forest Department, assisted by a USAID project, has an active program which includes fuelwood plantations in the settlement areas as well as, equally important, reforestation in the Upper Mahaweli Catchment area. Fuelwood plantations of eucalyptus and casuarina on 21,600 acres and trials of leucaena have been planted to the end of 1984, and it is planned to cover 35,000 acres by 1987. On-farm reforestation, which has involved local farmers in tree planting and intercropping with food crops, has covered 455 acres in 1984, and a further 2500 acres are to be planted in 1985. In addition, to date, the Upper Mahaweli Catchment reforestation program has covered 13,950 acres out of a planned 24,000 acre project with pine, eucalyptus and acacia species. Other Forest Department programmes include reforestation of 400 acres annually in degraded areas of Mahaweli, provision of fuelwood plantings on another 4234 acres by the end of 1985 and reforestation of an additional 3311 acres.

Additional plans are being made for closer co-operation between the Authority and the Forest Department. These plans involve Mahaweli staff training and assistance with a forest tree nursery which is to be established in the Mahaweli area. Expanded efforts such as these are essential if the current degradation of forest resources in the Mahaweli area is to be reversed.

5.3.5.2 Wetlands

No plans have been made for these low lying flood plains located primarily in System B. They are water catchment areas for locally heavy rains and normally are flooded from October to February

each year. It is likely that they will continue to be used as dry season pasture for local cattle. However, cattle numbers are rapidly decreasing as the normal wet season pasture is reduced under the settlement and cultivation program.

5.3.6 Extension Staff

The five project level agricultural officers who were contacted (working in the three project areas of System H and in Systems C and B) were knowledgeable, hard working and cooperative. Marketing Officers and the one Demonstration Farm Manager who were also contacted appeared to be equally competent. All were university graduates who had worked up from lower level postings and had appropriate experience for their positions. Block and Unit level staff had less educational qualifications and experience and were correspondingly less knowledgeable, but were no less cooperative and enthusiastic about their work.

While System H is staffed with Subject Matter Specialists at the project and block levels, Systems C and B have no Subject Matter Specialists. Furthermore, although sufficient staff positions exist for Field Assistants, there are still a number of vacancies in Systems C and B. Now that irrigation is expected to be available in many areas, it is essential to properly staff these systems so that early farmer training and consultation on water management and agricultural problems can take place. In addition to a shortage of staff, lack of adequate transport and of soil testing and water measurement equipment are major constraints faced by the agriculture staff in providing the necessary services to new farmers.

5.3.7 Agricultural Training and Extension Activities

Timely and useful training classes and farm visits provide both pre-season and in-season information to farmers. Project level Subject Matter Specialists in System H conduct Block and Unit level staff training; Block and Unit staff, in turn, conduct farmer training and field visits and prepare on-farm demonstration plots. However, this work is too heavily oriented towards paddy production.

5.3.7.1 Crops

Discussions and interviews with a broad range of farmers indicated a reasonable knowledge of current production recommendations for rice and chilli culture including land and seed bed preparation, seed varieties, fertilizer, pesticides and weeding practices. They were less knowledgeable about other

crops, although many were familiar with soybean, cowpea, gram, groundnuts and common fruit and vegetable varieties. Much work is needed on soil and water management, irrigation methods and specific crop water requirements. Though several farmers surveyed could provide good cost of production data, the majority had little knowledge of record keeping or of general farm and money management. Non-paddy field crops, horticulture, soil and water management and general farm management need further area specific research and extension, especially for the farmers new to irrigated agriculture, for women and for families who have only been allotted a homestead plot.

5.3.7.2 Livestock

Many farmers expressed a desire for livestock assistance but said they lacked the capital and equipment to get started. Only under the Draft and Dairy Development Program has there been the necessary research and extension as well as marketing and processing infrastructure in place to support these enterprises. Under the Program per animal yield has increased from one or two liters per day to three and four liters per day. Improved feed, husbandry and breeding have not only increased daily output but also extended the lactation period from 150 to 200 days.

Over 100 families in System B have flocks of 10 to 15 laying hens of domestic breeds producing for local markets. Little is currently being done on production and marketing research or on upgrading breeding stock or egg quality, although it is understood that initiatives in this area are now under consideration. Given the existence of local interest and capability, there is a good potential for upgrading both the laying flock and egg quality for a broader market. A program modeled on the Draft and Dairy Development Program could usefully assist with the development of a poultry industry in the Mahaweli area. In addition closer coordination and cooperation should be developed with the National Livestock Development Board and with other livestock departments who perform extensive research on livestock management and production problems. These activities could yield a two or three fold increase in egg production.

5.3.7.3 Extension for Women

Women farmers are not excluded from technical assistance or training programs and the Agricultural Officers reported that 10% to 15% of the participants at extension classes and meetings have been women. However, there are no programs which address the specific needs of women -- such as homestead development -- nor are there women agricultural officers and field assistants with whom women can interact more freely than with male extension

workers. At present there are only two women agricultural staff members in the Mahaweli program. Yet women constitute 5% to 10% of new land owners, 10% to 15% of farm owners generally, and in older communities female ownership, resulting from inheritance, may exceed 50%. Women are also responsible for a significant portion of the agricultural labour. These percentages are of sufficient magnitude to warrant specialised training specific to women's needs if the full production potential of Mahaweli farms is to be realised (cf. section 6.5.7).

This will require greater attendance by women at agricultural schools and universities. Currently about 20% of agricultural university and diploma students and only 10% of the farm school students are women. Women who graduate from these courses primarily go into teaching and research. Given the percentage of women farmers and land owners in Mahaweli, a greater effort should be made to recruit women extension staff.

5.3.7.4 Private Sources of Technical Assistance

An additional source of assistance with improved technology which should be explored is the private sector agriculture suppliers. It is in the long term interest of these suppliers to have farmers use their inputs profitably if product sales are to increase or even continue. Many countries have involved agriculture supply firms in farmer training and technical assistance and have thus greatly expanded the profitable use of fertilizer and agricultural chemicals. Firms supplying soil and water management aids could also be involved early in this type of training program.

5.3.8 Agricultural Research

The Department of Agriculture has a good system of stations that conduct research of relevance to crop production in the Mahaweli area. Rice research is headquartered at the Central Rice Research Station in Batalagoda. The station is staffed with a full complement of the necessary disciplines and its rice breeding activities meet international standards. Applied rice research is conducted at regional stations and results are further adapted through on-farm trials conducted by field research and extension staff.

Research for the Mahaweli area, both dryland and irrigated, is conducted at the following regional stations: System H, Maha Illuppalama; System C, Girandurukotte; and System B, Aralanganwila. The latter two stations are not fully operational, particularly for irrigated research, but plans have been made and budgets established to develop these stations to

meet the needs of the systems. This will be necessary in order to undertake specific research of relevance to the wide variety of crops planned for the Mahaweli area. Publications and regional technical working groups of research and extension staff transfer research results to the system agriculture officers and staff.

5.3.9 Input and Marketing Services

5.3.9.1 Inputs

MEA provides supplies of seed, pesticides and fertilizer through block level stores in Systems C and B. Certified seed is provided by MEA or Department of Agriculture outlets and meets approximately 20% of farmer needs. These services are particularly useful in new areas where the private sector rural outlets are not yet operating.

In System H the MEA stores are being closed with the view that the private sector is well enough established to meet the needs of the settlers for fertilizer and pesticides. But although this is true for pesticides, where the private sector has been the major supplier for several years, there is evidence that this will not be so for fertilizer. The National Fertilizer Corporation has a monopoly on supplies and allows retail dealers a margin of only Rs 1.00 per 50 kg bag; consequently, while the private traders may stock fertilizer for a Rs 1.00 margin, they will not transport it to remote areas, as MEA has been doing. Eliminating this transport service may be a way of reducing the subsidy on fertilizer, but, given the current cost price squeeze (see sections 5.4.3 and 5.5), particularly on paddy production, it will probably also reduce fertilizer use (cf. findings of Vidanapathirana in Galnewa). Monitoring the effects of closing the MEA shops is necessary to ensure that reduced access to fertilizer does not become a constraint to increased crop production and profitability.

5.3.9.2 Marketing

Marketing and farm gate prices continue to be a problem even though considerable effort has been expended on the part of the Authority to assure that support prices are received. The Paddy Marketing Board (PMB) provides a floor price for paddy of Rs 3.00 to Rs 3.10 per kg. throughout the country. However, the cost of transport to the PMB stores and the PMB's strict quality standards have meant that probably no more than 10% of the paddy crop is purchased by the Board in any given season. At harvest time, when cash flow problems or debt commitments force most farmers to sell their paddy, the most common farm gate price is

likely to be Rs 2.50 to Rs 2.60. There have even been some reports that farmers who mortgage their crop to traders and money lenders may be getting as little as Rs 2.00 per kilo of paddy. In contrast, traders and farmers who are in a financial position to hold paddy until midway between harvests may obtain Rs 3.50 to Rs 3.70 per kg. As will be suggested again in section 5.4.4, one way of improving the price received by farmers is to establish a bonded storage system. This would be of great benefit to paddy farmers who could then get part payment for their crop when it is harvested and put in storage. They would then retain ownership of the crop and be able to take advantage of post harvest increases at the time of final sale.

In Systems C and B the MEA Marketing Assistants travel to certain hamlets to buy other non-perishable field crops. The price MEA pays is based on contracts established with various private and public corporations who purchase these commodities in bulk. MEA provides the services of transport and bulking for a reasonable charge and the farmers have an opportunity to receive a price which would otherwise be unobtainable. However, the Assistants pay by receipts which can only be redeemed for cash at the local bank branch. The bank branch may be some distance from the settlers' homes and the need to go there to get paid appears to be somewhat of a deterrent to selling to MEA.

A successful example of how to improve marketing and incomes for farmers is the Draft and Dairy Development Program which started a project in System C in January 1984. The project in System C assists producers with all activities from providing breeding stock to retailing processed milk. Having begun with only a few members, the project now has 300 members producing 600 liters of milk daily. This is sold fresh and also processed into yoghurt, ghee and curd for the local market. Two hundred liters are sold fresh to the Milk Marketing Board.

In January 1985 a new dairy development project was started in System H. This now has 33 members producing and processing 150 liters per day. Plans call for training farmers to take over the collection, processing and retailing operations once the activity is fully operational. The involvement of farmers in an integrated production and marketing system is commendable and worthy of duplication by other commodity groups (see additional discussion in section 5.4.4).

5.3.9.3 Credit

Settlers are assisted with bank credit by the MEA Marketing and Credit Assistants. In order to receive a bank loan a farmer must have system irrigation water available on the farm and thereby be able to provide some assurance of the ability to

attain the harvest necessary to repay a loan. Nevertheless, with the difficult growing seasons experienced by many farmers in the three systems and with the subsequent defaults on previous loans, it is estimated that no more than 30% to 40% of the farmers receiving irrigation water are still eligible for bank loans (cf. discussion in section 4.4.5).

5.4 Other Factors Affecting Farm Production and Incomes

5.4.1 Efficient and Equitable Water Management and Allocation

Efficient and equitable water management and allocation have not been achieved due to a lack of trained staff and of sufficient water measuring devices as well as an over-emphasis on irrigation infrastructure and land clearing. Furthermore, so far in none of the systems has on-farm land development progressed to the extent that projected yield and production levels can be attained throughout the system. Although clearing and levelling appear to have been timely (cf. section 5.3.2), all systems are, in varying degrees, behind in their on-farm land development targets.

In most cases so far, settlers have been in place two years or more ahead of reliable irrigation water and the absence of reliable water availability has been the main reason for delayed on-farm development. Delayed on-farm development has, in turn, had an adverse effect on farm production and incomes and has consequently contributed to indebtedness among many settlers. Only for the first time in Maha '84/'85 was water not a constraint to good production in System H where a good monsoon was supplemented with irrigation water to provide sufficient irrigation water to 100% of the system. In Yala '85 plans call for 50% of Galnewa and 80% of Thambuttegama and Nochchiyagama to be irrigated. Systems C and B are two and four years away, respectively, from reasonably full land development (cf. sections 4.1.3 and 5.3.1).

These observations indicate that in most cases it takes two years, i.e. two seasons each of Maha and Yala cropping, with reliable water, to develop the full potential of newly irrigated land. Furthermore, this development will only occur if channel alignment, water distribution, levelling and drainage problems which are discovered in that period are quickly resolved. Farmer complaints indicate that failure to achieve a timely resolution of these problems has been a problem in the past.

The pilot project in the Thambuttegama Project has an underground pipe system of water delivery which was installed to demonstrate water use savings and efficiency. However, it is reported to be using more acre feet of water than the unlined open ditch system.

Water issuing schedules have been adjusted to type of crop and projected water availability and system, zone or even block and unit level adjustments in water deliveries can be made. Yet on-farm applications are reported to often be at the whim of the individual and to have little relation to actual crop needs. Despite the efforts of Block Engineers, Unit Managers, turnout groups and Turnout Leaders to arrive at equitable water allocation, there have been reports in all systems that too much water has been used at the head end and too little has been available at the tail end. Trained staff, water measuring devices, more strict controls and greater experience of farmers will be necessary before equitable and efficient water management will be achieved.

5.4.2

Farmer Organisations

As emphasised in section 5.3.4, the involvement of farmers in organisations that provide them with more control over their farming operations is essential. Such involvement will lead to more efficient and profitable enterprises and will not only help the individual farmer but will promote rural prosperity and benefit society and the economy as a whole by providing higher quality food more efficiently. These benefits can be achieved provided that a reasonably free market oriented economy is allowed to function.

The Authority has encouraged the formation of farmer turnout groups for irrigation management and of community development societies, but they have generally not been successful and have demonstrated little active farmer participation. Both types of groupings have been organised and managed by the Authority. Neither organisation has had either any authority or funds, with the result that they have been given responsibility but few resources with which to fulfil their responsibility. Although there are cases where cohesive groups operate a field canal turnout efficiently and equitably, generally turnout leaders have no authority to meet the needs of their group. Instead they must depend on their influence with Authority officials to solve problems. When Turnout Leaders are unable to obtain positive results, individual members have been known to resort to using their own influence to resolve their own particular problems and the co-operative nature of the group has quickly dissolved (ref. discussion in section 6.5.6).

It is clear that the development of effective farmer organisations is difficult, but a basic rule for success is that authority must go along with responsibility. Turnout Leaders should have specific areas of authority, regardless of how limited they may be. They can then at least function effectively

in these areas and may subsequently possibly exercise greater positive influence after achieving success and experience in the more limited sphere. The best solution may be to consult with individual turnout groups to see what type of responsibility and authority they want in managing their irrigation facilities. It may be appropriate to engage paid farmer leaders as field canal managers, as has been done in some countries.

Successful groups could well form around a mutually beneficial activity for which the members have the responsibility and authority to accomplish their goals more easily as a group than as individuals. Commodity groups may be the answer in getting co-operative work started. Dairying has shown itself to promote strong producer cohesiveness. Other commodity groups for poultry, bee-keeping or various other crops may also be successful.

5.4.3

Farm Labor and Power

Access to adequate labor and power is critical to timely and thereby highly productive agriculture. An increased cropping intensity has put a greater emphasis on timely operation. As a result it has been observed that increased double cropping as well as multiple and inter-cropping have brought about an increased reliance on hired labor. This is because family labor is not sufficient to meet peak labor demands and exchange labor is less available because all neighbouring farmers are working under the same time constraints. Consequently seasonal labor shortages and higher priced labor have brought about an increase in production costs and have reduced family incomes.

More bullock and mechanical power is also being used. Although the Draft Animal (DDD) Project is introducing improved draft animals, it cannot meet the demand for improved animals. MEA has four-wheeled-tractors available, but these appear to be used primarily for the free initial land preparation. More power tillers (two-wheeled-tractors) are being used in the project area but most of the benefit from their use appears to be going to the power tiller owners who do custom tillage for their neighbours. Nevertheless, all indications are that with 2 1/2 acre holdings and two or more crops per year, a greater use will be made of animal and tractor power.

Thus, access to, and profitable management of, labor and additional power will be a major factor in the success of new settlers. Data on Gal Oya show regular increases in the use of mechanised power among larger, more successful, farmers. This is a trend that can be expected in other irrigation projects. Furthermore, labor shortages and greater dependence on animal and mechanical power to accomplish production tasks may be promoted

in the medium term if increased rural prosperity generates better off-farm employment opportunities. Teaching new settlers to manage these factors of production in a more efficient manner will contribute to the success of the farmer and of the project generally.

5.4.4

Marketing

MEA and GSL marketing assistance in the project area has been discussed in a previous section (5.3.9.2). The limited purchases by MEA marketing staff in Systems C and B, the Draft and Dairy Development activity in Systems H and C and the chilli and soybean production organisation in System H, are examples of how transportation and the bulking of small amounts of produce for processors have been successfully provided.

The Dairy Development project has taken the activity a step further by involving the producers in processing and retailing. Dairy Development Project staff were able to identify local needs for yoghurt, curd and ghee which minimized transportation and handling costs. The National Milk Board has provided an outlet for surplus in excess of local needs while the higher value added local needs have been met first, thus benefitting both local consumers and producers. Undoubtedly local food requirements other than milk could be met by local processing rather than transporting products out of the area for processing and then re-importing the processed product at a much higher price.

Innovative efforts such as these must be extended all along the marketing and processing chain if farmers are to realize a larger share of the retail price. Activities that allow the farmer a greater say in determining the price to the ultimate consumer and a greater share of that price result in a more prosperous rural community. When a farmer loses control of his crop prior to harvest as appears to frequently be the case at present, he usually receives the least returns. As mentioned earlier bonded storage is one way of extending the period of control to realize post-harvest price increases.

Facilities for transport from the farm gate and for bulking small quantities of product for processor purchasing is another way of assuring increased incomes and thereby increasing production of field crops such as soybeans, cowpeas, groundnuts, grams and maize. Increased production of fruits and vegetables for fresh sale or processing, though requiring more sophisticated market analysis and packaging to maintain quality, will respond to the same transportation and bulking activities. Farmers along with MEA Marketing Assistants must learn to identify markets then provide products to meet those market demands.

Access to credit is seen by many Authority officials and new settlers as the major constraint to farmers' success. For various reasons institutional credit, which is offered at an interest rate of 9% per annum and is supervised by local banks, seems to be meeting no more than 10% of the settlers' credit needs. At the same time, although there are isolated exceptions, the collection rate on bank loans in all three systems has been no more than 65%. In contrast, traditional sources of credit, such as money lenders, traders and friends, provide the bulk of credit at interest rates of between 10% and 20% per month and appear not to suffer from high default rates.

The People's Bank in Anuradhapura was visited by the team. The Bank operates a special program to support Mahaweli settlers with production loans for paddy up to a maximum of Rs 6,000.00 per farmer per season. No physical security is said to be required; and the need to have two consigners is waived once the farmer establishes a good credit rating. The loans are disbursed in tranches as needed by the farmers. Payment is made directly to the suppliers of inputs such as seed and fertilizer. Thus cash payments to the farmer are severely limited, possibly limiting the choice of supplier and raising costs of production. The duration of the loan is about 5 months with repayment due immediately after harvest (when prices for farm products are lowest). Similar arrangements with different loan amounts and schedules are available for subsidiary crops. The bank requires the farmer to pay for crop insurance which rarely covers production costs.

According to the bank officials farmers with repayment problems may have their loans rescheduled if the problem is due to weather or otherwise beyond the farmer's control. However, the rediscount facility at 4.0% is limited to 5 months and penal interest rates are imposed by the Central Bank thereafter. This sharply reduces the attractiveness of making production loans from the point of view of the bank.

Opinions differ as to the reasons for such a high default rate. Some of the information suggests that at current prices and farm practices farmers simply do not make enough money to carry loans. Others suggest either the absence of a tradition to repay bank loans or the effect of previous government debt forgiveness programs contributed to the high default rate. The bank offices visited were in poor condition, crowded, with people waiting in what seemed to be confused knots in every available space. Working conditions were poor; bank clerks seemed harried and clients seemed exposed to extremely long waits and perhaps had to make repeat visits over long distances. Banking hours

are short given the large number of customers.

Commercial banks have conducted a number of studies on the problem of credit needs, supervision and loan collection. Their recommendations have emphasized better selection of borrowers and closer supervision. Some projects are fielding teams composed of bank officials and MEA staff in an attempt to achieve better supervision and an improved collection percentage. Their initial efforts show an 80% to 90% collection rate, but the cost is considerable and the teams are able to deal with only a small proportion of the credit needs. An important constraint on increased availability of well-supervised institutional credit is the low rate of interest which limits the banks' income to cover supervision costs. A more realistic annual interest rate of 25% would help to pay for closer supervision and for more effective collection of loan repayments. It would also generate more loan funds. Even at this higher rate of interest farmers will be offered credit at one-quarter to one-eighth of the interest rates charged by traditional money lenders.

Regarding the role of traders and money lenders, there is cause for concern in reports by farmers and agriculture staff that old irrigation schemes such as Zone 1 of System C and Pimburettewa in System B are averaging lower yields and less total output than in previous years. The reasons given for this decline are land exhaustion after continuous cropping and lack of investment in inputs by traders who rent land or receive the right to farm land as part of debt payments. These reports should be properly assessed and systems devised to correct the situation if the reports are correct. Expensive resources such as irrigated land cannot be allowed to lose their productivity.

Another suggestion that is being studied in other developing countries is to work with traditional credit sources at the local level. Additional credit is channelled through the money lenders at rates favorable to both the money lender and the farmer. For this system to effectively assist farmers a careful study and a great deal of cooperation is required from both parties. But the fact remains that money lenders have continued to be important in developing countries despite countless efforts to replace them with formal institutional credit sources. If ways can be found to work with, rather than against, the traditional system then a way may be found to have an impact on this perennial credit problem.

5.5 Project Impact on Farmer Production and Incomes

Profit margins associated with good yields and management can be sufficient to act as an incentive to increased production of rice and most other field crops. Nevertheless, as will be

demonstrated below, current prices and average yields for paddy do not provide most farm families with a labor income that will offer the discretionary income to improve nutrition and increase consumer goods purchases. A major problem of the Authority is to assure the availability of reliable supplies of water, production inputs, and of markets.

5.5.1

Yields and Prices

In the short run it would appear that the best way to increase farmers' profitability from paddy production would be to increase yields to above 100 bushels per acre. The Resident Project Manager in Galnewa, System H, has reported an average yield of 107 bushels per acre in Maha '84/'85 which indicates that profitable yields can be obtained once reliable irrigation is available throughout a project or system. However, most project areas are reporting averages of 60 bushels per acre in Yala and 80 bushels per acre in Maha. This compares with the national average for paddy in 1984 of 70 bushels per acre.

A 70 bushel crop at the PMB floor price of Rs 60 per bushel (Rs 3.00 per kg.) gives a gross income of Rs 4200 per acre. At an estimated cost of between Rs 3500 and Rs 4000 per acre (counting all labour, interest and water charges), the farmer stands to receive a net return of only Rs 200 to Rs 700 per acre for paddy. Even if the family labor value, estimated at Rs 1700 (for 50 person days per acre), is deducted, a maximum return to family labor would only be Rs 2400 per acre. This would represent a total income of Rs 6000 on 2 1/2 acres for half a year's work for the family. This is only a subsistence income and it does not represent an incentive for growing paddy as a cash crop.

If a yield of 100 bushels per acre is achieved and the higher cost of production of Rs 4000 per acre is assumed, then a labor income of Rs 3700 per acre may be realised.^{2/} With two crops per year on 2 1/2 acres this represents a potential annual family labor income of Rs 18,500. This would provide an income of Rs 1,542 per month which is well above the Rs 1,000 estimated

2/ Calculated as follows:

100 bu. yield x Rs 60 = Rs 6,000 gross income

minus - Rs 4,000 expenses
plus + Rs 1,700 imputed value of family labor

Rs 3,700 labor income to the family

by the Authority to be the minimum income needed to maintain the average settler family. Thus a 100 bushel per acre paddy yield would provide the settler on a 2 1/2 acre holding with the discretionary income to purchase consumer goods and additional production inputs that will fuel growth in the national economy. But it should be emphasised that so far only a minority of Mahaweli settlers would appear to be achieving such yields.

Given the close price margins from paddy to retail, an intensive study of the many factors involved must be undertaken before changing the floor price of rice. The current floor price for paddy when converted to milled rice at 60% of paddy is approximately Rs 5.00 per kg. of milled rice. The retail and wholesale price of various grades of rice and the differential between wholesale and paddy converted to a milled rice price are as follows :

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TABLE 5.2: Price Differential Between Wholesale and Paddy
Converted to a Milled Rice Price for various
Grades of Rice

RICE TYPES	RETAIL	WHOLESALE PRICE	DIFFERENTIAL FROM PADDY ON A 60% MILLED RICE BASIS AT RS 5/KG*
Samba Grade II	7.77	7.15/kg	Rs 2.15
Kora Grade II	7.43	6.60/kg	1.60
Raw Red	7.67	6.77/kg	1.77
Nadu Grade II	6.59	5.60/kg	0.60

* Based on PMB floor price of Rs. 3.00 per kg.

Wholesale and retail price source: "ARTI Food Commodities Bulletin No. 19", 17 to 23 May, 1985.

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However, a comparison of the prices farmers receive with the cost of imported rice does raise questions about the equity of the price to the farmer. Two issues of local newspapers on 26 May, 1985 reported the necessity of importing over 100,000 metric tons of rice from China. One newspaper put the import cost at Rs 8000 per ton or Rs. 8.00 per kg. Quoting the National Food Commissioner one paper stated the problem was not one of production in Sri Lanka but of transporting stocks to deficit

areas and maintaining the security of government stocks and co-operative stores. If increased farm gate prices can provide the stocks and distribution to relieve the necessity of importing rice then this would be better for the general economy than the purchase of comparatively high priced imported rice. In the long run imported rice can only reduce the demand and consequently the farmer price for domestic rice.

Prices and yields of other field crops provide an even higher net income than paddy when good management and recommended cultural practices are followed. Farmers growing chillies and soybean report net incomes of Rs 5000 and above per acre after considering all costs and not deducting for family labor (see Table 5.3 for floor prices of subsidiary food crops).

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 Table 5.3: Floor Prices Of Subsidiary Food Crops

Crop	Revised Price (Rs per kg)
1. Cow-Pea	5.50
2. Green-Gram	7.50
3. Gingelly (Sesame)	6.00
4. Soya Bean	6.00
5. Ground Nuts	6.00
6. Chillies (Dried)	21.00
7. Black Gram	4.50
8. Maize	3.00
9. Kurakkan (Finger millet)	2.75
10. Bombay Onions	5.25
11. Red Onions	3.75 Feb. to July
12. Red Onions	4.50 Aug. to Jan.

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 1. Floor Price as revised in August and December 1983.
 2. These prices were obtained from the Ministry of Agriculture Development and Research on July 17, 1984.
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The adjustment from the high expectations of a new settler to the hard realities of managing a 2 1/2 acre irrigated farm is a sobering one, especially for farmers inexperienced in managing irrigated enterprises of this size. Furthermore, outlays for the production inputs needed to gain profitable yields are high and the risks have been great in the absence of reasonable water management. Consequently expected yields have not been reached and motivation has suffered. With average yields substantially below the level required for acceptable returns to family labor under the current relationship between costs and prices, the level of risk is a disincentive to surplus production above family consumption needs.

As was demonstrated above, a family cultivating 2 1/2 acres of irrigated land, with 125 labor days provided entirely by the family, and achieving a yield of 70 bushels an acre, can expect a family labor income of Rs 6000 per season. However, paddy has peak labor requirements at planting and harvesting time and most families hire about 1/2 their labour, or 60 days per season, at a rate of Rs. 30 per day. This reduces the net income to Rs 4200 per season or Rs. 8400 annually. This is Rs. 3600 less than the Rs. 12,000 projected by the Authority as necessary to sustain the average settler family.

Off-farm work or other income generating farm enterprises are necessary to make up the deficit if the standard of living is not to suffer. If sufficient off-farm employment is available two family members each working 200 days per year at Rs. 35, can earn Rs. 7000 each or Rs. 14,000 per year. This is considerably above rice production and may be one reason why, so long as construction employment is a possibility, a number of farms are being partly or incompetently farmed. In the short run working off the farm may offer a more assured income without requiring the investment and inherent risks of farming.

On the other hand, with assured irrigation water and yields in excess of 100 bushels per acre, paddy is more profitable than average off-farm employment. Diversification into other field crops where inputs and markets are assured can be even more profitable.

An essential element in a land settlement program is a belief among settlers that at least a potential exists for them to enjoy an improved standard of living. In our limited survey of settlers in the three systems this belief was held by 95% interviewed. Our interviews included discussions with farmers at the head and tail end of turnouts and field canals, resettlers, evacuees and selectees, previously landless settlers and settlers with sizeable resources from compensation or previous investments. Only a few resettlers who had been dispossessed from sizeable holdings felt they were worse off under the Mahaweli program.

However this highly favourable response rate may have reflected the views of recent rather than early settlers. In contrast to the results of our interviews, it was reported in some areas that 20% to 30% of farmer settlers had departed and/or were renting out their land. Those who had left the area could, of course, not be interviewed. But Thayer Scudder's report to USAID of January 1985 observed that a number of settlers in System H were becoming discouraged and leaving the area. Scudder's major concern is that over time settlers who had arrived with high expectations and who had struggled for four or five years to get established were losing their optimism and motivation.

While, as was illustrated above, the potential exists for the standard 2 1/2 acre plot to be financially viable, it can be roughly estimated that 20% of new settlers are currently doing well, 20% are failing and renting their land out, and 60% are just managing while they await land development, reliable water issues and an economic environment that will promote prosperity given good cultural and husbandry methods.

Since renting out land and leaving the area jeopardizes a settler's right to the land there are no official records on the actual extent of land rental or abandonment. There also appear to be no studies which determine why settlers leave and it is not clear what efforts are being made to correct the situation and reduce the number that depart. It should be recognized that land rental is taking place and research should be undertaken to improve equity. Only through recognition of, and finding solutions to, settlers' problems can renting and departure from the area be reduced.

5.5.5 Contribution to Reduced Cereal Imports

The potential to reduce cereal imports exists but the projects have not yet developed to the point of having a major effect on total country production. Nevertheless, with continued development System H should make a contribution in 1985, System C in 1987 and System B in 1989. There is no indication that the speed of development will surpass these dates. The most critical factor determining the cereal production and import substitution will be the achievement of the set of conditions previously outlined to bring about continued on-farm development and maintenance of these systems as they are developed. Rural prosperity will be the key factor in assuring continued development and maintenance.

5.6 Monitoring, Evaluation and Administration

5.6.1 Monitoring and Evaluation of Agricultural Development

Realistic in-house evaluation by the MEA is lacking. Monitoring and reporting in considerable detail is routine but evaluation of this data for project guidance, administration and improvement with regard to settlers production and incomes is not done to the extent necessary to correct and improve management procedures. Transportation shortages, lack of irrigation system maintenance, need for daily local market information on crops and livestock are three diverse examples of areas that due to lack of information or effective action are major constraints to agricultural productivity. Emphasis has been so much on settlement and infrastructure development that making efficient use of these facilities has been neglected.

5.6.2 Administrative Soundness

The organizational procedures have been established and are in operation, but the top-down management style associated with them inhibits the development of local leadership and organizations. Local leadership is a major source of development energy that should be constructively promoted. Giving local organizations responsibility, authority and resources is the best way of channeling this energy and developing local initiatives and management capability.

The importance of a shift in emphasis from settlement and infrastructure construction to on-farm improvements and post-harvest enterprise development emphasizes the need for improved

collaboration and coordination between the Authority and the other relevant line ministries and agencies. Similarly, within USAID, the time has come for a greater involvement of the other offices, particularly Agriculture, in monitoring the results of USAID involvement with the AMP and in discussions and consultations with the Authority regarding future activities in support of settlers.

6. SOCIO-ECONOMIC EVALUATION OF AMP COMMUNITY DEVELOPMENT IN SYSTEMS H, C AND B

6.1 Introduction

This chapter assesses the effectiveness of AMP community development activities in ensuring that USAID assistance through Phases I and II and Sector Support is being translated into the socio-economic goals which have been set for the Mahaweli Scheme by GSL. Underlying this assessment is the fact that while USAID financial contributions for capital construction may be a necessary pre-requisite for achieving GSL goals for the AMP, they are not on their own sufficient for success. Furthermore, there has been a lag between the conclusion of construction work and the establishment of the socio-economic momentum which is hoped for.

6.2 Project Logic and Evaluation Method

The link between USAID capital assistance and GSL goals is embedded in a set of other conditions which are outside USAID control but which have a direct impact on the effectiveness of USAID's contribution. The logic of the AMP can be traced roughly as follows :

- (a) From the outset the goals of the AMP have linked agricultural production benefits with a distribution of productive assets (essentially land) for the benefit of the poor and landless and with employment generation. In order to achieve this combination of objectives it was envisaged that settlers would demonstrate certain qualities such as relative youth, education, agricultural background, pioneering spirit and economic need (see WFP and MASL :51). Settlers with these qualities would create a dynamic population ready to adopt new productive practices and willing to intensively and efficiently cultivate 1.2 1/ hectare holdings (3 acres) - primarily using family labor.
- (b) The initial practical and social difficulties associated with new settlement were to be alleviated through initial land development and through the provision of a minimum amount of materials and financial assistance (for tools, housing, bund

1/ This includes 1 hectare of irrigated lowland and .2 hectares of unirrigated highland, or homestead.

formation, sanitation and well construction materials, food aid) and through the friendly assistance offered by the MEA unit manager.

This assistance combined with settlement in homogeneous clusters and with the availability of basic social infrastructure such as schools, health services, post offices and police stations, banks, shops and roads would provide the foundations for a cohesive community.

- (c) With the assurance of two irrigated cropping seasons and with the benefit of sound technical advice, access to the necessary inputs and to markets offering adequate and appropriate farmgate prices, an agricultural surplus would be generated. This surplus would in turn fuel the regional economy and create new jobs for the settlers' children as they grow up and enter the labour market.

While USAID funding has been channelled primarily into capital expenditure on irrigation and, to a lesser extent, settlement, on-farm development and social infrastructure, its effective contribution to the GSL/AMP goals depends on the satisfaction of the other assumptions and linkages outlined above.

The socio-economic evaluation has therefore (a) examined the general characteristics of the settlers to determine the extent to which they have conformed to the anticipated norms and to determine the implications for the success of the program in assisting the intended beneficiaries to achieve production and income objectives; (b) reviewed the provision of settler services to determine if they have been of a kind and of a quality adequate to get settlers off to a good start and to sustain a well-integrated community; (c) assessed the extent to which agricultural development and farm incomes are creating the broadly based effective demand which it was hoped would contribute to regional economic growth and employment creation.

The conclusions presented here regarding the effectiveness of community development assistance have been based on a review of relevant reports, discussions and data collected from Mahaweli officers in Colombo and in the field and on settler interviews conducted by a team of two Sri Lankan sociologists and two Sri Lankan medical investigators. The settlers interviewed in the course of nine days of field work in Systems H and C were selected to represent evacuees, purana villagers (including Veddah resettlers), encroachers and electoral selectees. The settlers interviewed have been in the project areas for varying durations and have been cultivating land at various points along the irrigation field channels. Interviews were also conducted

with farmer leaders, teachers, traders, craftsmen, health volunteers, and other medical personnel, policemen and postal clerks. The limited time available meant that the number of people interviewed was small 2/ and pragmatically, rather than randomly selected. Consequently rather than representing a statistically valid source of information from which to generalise about the Mahaweli population, survey results have been used to provide a field baseline for the assessment of data and observations from other sources. At times the survey results have provided a validation of tentative conclusions, at other times they have indicated areas requiring further investigation before a firm judgement can be made.

Unfortunately, security disturbances in the System B area made it necessary to curtail the field review in that area after only one day visiting the project headquarters in Aralanganwila. It has consequently been necessary to assess settlement progress in System B on the basis of limited staff interviews, progress reports and inferences that can be made from observations in Systems H and C. Although this has meant that there has not been an opportunity to undertake field checking which could strengthen arguments and highlight specific achievements and problems in System B, the information which has been available supports the validity of the broad conclusions presented here.

6.3 General Characteristics of the Settlement Population

Although it was originally envisaged that settlers would be selected according to criteria which would make them "ideal settlers", the need to accommodate an unanticipated number of resettlers and evacuees has meant that to date, with settlement in the three systems now about 60% complete (see Table 6.1), less than 20% of the settlers in Systems H, C and B (left bank) have been electoral selectees chosen according to the pre-determined norms (see Table 6.2). However, nearly 90% of the remaining settlers are expected to be electoral selectees (see Table 6.3) and as settlement progresses in Systems C and B the proportion of electoral selectees in the population of the three systems should reach nearly half. By the time allocation of paddy and homestead plots is completed in Systems C and B, "selectees" from the electorates are expected to represent around 65% of settlers.

2/ 49 informants (including both husbands and wives in settler households) were interviewed by the Sociologists using a structured open-ended questionnaire focussing on settler attitudes to their settlement activities and to services received from the Mahaweli Authority.

46 mothers were interviewed by the medical investigator also using a structured open-ended questionnaire focussing on disease incidence, water and sanitary facilities and use of health services.

Table 6.1: Total Number of "Settlers" Inducted to Program and Planned as at March 1985

System	(a) Number of "Settlers" 31 March 1985	(b) Total number at Full Development	(a) % of (b)	Expected Date of Settlement Completion
H	27,737	27,737	100	1985
C	9,782	21,419	46	1985
B	7,445*	26,553	28	1987
Total	44,964	75,709	59	

Note: Includes settlers on homestead only plots as well as settlers with paddy and homestead plots (cf. Table 5.1).

* Includes 1382 settlers from Pimburettewa Scheme.

Source: Table 6.2

Note: Table 6.2 is on the following page

Table 6.3: Type of Settlers in Remaining Settlement Programs

System	Resettlers		Evacueees		Selectees		Total	
	No	%	No	%	No	%	No	%
H	0	-	0	-	0	-	0	-
C	75	.6	0	-	11,562	99.4	11,637	100
B	3041	15.9	0	-	16,067	84.1	19,108	100
Total	3116	10.1	0	-	27,629	89.9	30,745	100

Note: These totals include settlers receiving homestead only plots (1/2 acre) plus settlers receiving both homestead and paddy plots.

Source: Table 6.2

Table 6.2: Types of Settlers According to Basis For Selection:
Current and at Completion of Settlement

System	1985								At completion of Settlement							
	Resettlers		Evacuees		Selectees from Electorate		Total		Resettlers		Evacuees		Selectees from Electorate		Total	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
H	21,951	79	1,680	6	4,106	15	27,737	100	21,951	79	1,680	6	4,106	15	27,737	100
C	1,902	19	5,563	57	2,317	24	9,782	100	1,977	9	5,563	26	13,879	65	21,419	100
B	4,378**	58	1,460	20	1,607	22	7,445	100	7,876	29	1,235	5	17,642	66	26,553	100
Total	28,231	63	8,703	19	8,030	18	44,964	100	31,604	42	8,478	11	35,627	47	75,709	100

* Includes 12,794 allotted paddy plots plus 4,648 on highland plots only.

** Includes 1382 settlers from Pimurettewa Scheme

Notes - Inconsistencies in total figures between tables reflect inconsistencies in data obtained from varying sources. The data are presented to indicate orders of magnitude and trends rather than firm estimates.

- See glossary for definition of "settlers", "resettlers" "evacuees" and "selectees from electorate".
- Figures include settlers on homestead only plots as well as settlers w/ paddy and homestead plots.

Source:

- H - RPM's offices Galnewa, Thambuttegama and Nochchiyagama April 1985
- C - DRPM Lands, System C 18 May 1985
- B - Progress Control Division. First Quarter Progress Review 1 April 1985 and Land Officer, System B, 20 May 1985

Unfortunately, although there appears to be a great deal of data available, so far very little can be readily used to form a judgement regarding the demographic and socio-economic characteristics of the settlers. Nevertheless a general idea can be derived from secondary sources and informed "guestimates".

The matrix in Table 6.4 presents certain crude assumptions about the likely distribution of the selection characteristics among different types of settlers - evacuees, resettlers and electoral selectees. These assumed proportions are weighted by the proportion each type of settler represents in the total population to arrive at a very rough idea of the consequences for the overall incidence of these characteristics in the settlement population. The results of these calculations are presented in Table 6.5.

The results confirm the already well acknowledged fact that System H has a smaller proportion of "young" settlers than C and B will have at settlement completion and that 26% of the population (roughly 36,000 young people between the ages of 11 and 20) is either in the labour market or will be entering it in the next five years. While the proportion of young people between ages 11 and 20 in Systems C and B at the time of settlement completion may be less than in H, this could still represent approximately 19,000 young people in C and 22,000 or so in B. 3/ Thus, assuming that all farm and non-farm jobs currently available in the project area are already filled by settlers of more than 20 years of age, 76,000 new jobs will have to be created over the next five years to absorb the number of young people who will be looking for employment in the three systems (this assumes that young women and men will be entering the labor market in equal numbers and will look for employment within the systems).

Only a small proportion of these young people have the prospect of finding full time employment in agriculture, and even a smaller proportion can hope to inherit their parents land. This is what is frequently referred to as the "second generation problem" and has been recognised by the Mahaweli Authority (see Section 6.6).

3/ These estimates were reached by multiplying the total number of settlers planned for 1987 by 5, to arrive at an estimated total population. The total population was then multiplied by the estimated proportion of the population in the age group 11-20 years.

Turning now to the educational and farming qualities of the settlers, it would appear that the large majority of settlers, regardless of their origin have a certain amount of schooling which will make it easier to conduct relevant training programs. The level of education in Systems C and B may become relatively higher as more selectees are brought in. Regardless of origin, most settlers will have an agricultural background, although there is undoubtedly a minority who will have obtained paddy land despite a lack of real interest or experience in cultivation.

Another exception of the "agricultural background" requirement may be found among those approximately twenty per cent of settlers who are given only a homestead allotment on the grounds that they will contribute the non-farm skills and services needed by the farming population, as well as possibly adding to the agricultural labor pool.

Regarding landlessness, data on the quantity of land owned and operated by the settlers before settlement is either unanalysed or unavailable. Given general figures on the proportion of the population with less than 2.5 acres of paddy in the resettlement areas as well as in the places where evacuees and selectees have come from, it may be possible to conclude that the majority of settlers have benefitted from an increase in their land assets.

However, this has not necessarily meant that land has been allocated to the most needy or to the most able. There has been some evidence that while the wealthier and more influential resettler and evacuee families were able to benefit from compensation for property lost and from the alienation of more than one irrigable Mahaweli plot per family, some poorer families particularly among the resettlers, were actually passed over when settlers were being registered. It is not possible to determine what proportion of the settlement beneficiaries could be called absolutely poor in terms of income or wealth.

With regard to willingness to adapt to the technical requirements of farming within a major irrigation scheme, various observations have been made contrasting the dynamism of evacuees and selectees with the conservatism of certain other groups, most particularly the purana villagers and the Veddahs. There are some reports that members of these groups are disproportionately represented among those leasing out their land and becoming laborers. If this is the case it should be recognised that AMP settlement is generating an economic displacement of the original residents of the newly developed areas. Their socio-economic status should be monitored to ensure that they are not being economically marginalised as a social group.

Table 6.4 : Assumed distribution of Settler Selection Characteristics Among different Types of Settlers in the AMP

Selection Criteria	Evacuees (1)	Resettlers (2)	Electoral (4) Selectees
<u>Relative Youth</u> % of males (settlers) between age 20 - 40	42.4%	59%	90%
<u>Education</u> % receiving some schooling	78.2%	77% (5)	90%
<u>Agricultural Background</u> % giving farming as primary occupation	87.6%	81.0% or higher	90%
<u>Pioneering Spirit</u> % who do not resent their subjection to the AMP	50% (4)	75% (4)	100%
<u>Landless or Poor</u> % owning or operating less than 2.5 acres of land before resettlement	80% (3)	60%	90%
<u>Readiness to adopt new Productive Techniques</u>	80% (4)	60% (4)	90%
<u>Second Generation Problem</u> % of population between ages 11-20	32.8%	27.7%	10%

Sources: As indicated at the top of each column unless noted otherwise.

- (1) Samrasingha : 20
- (2) Ranasinghe, et.al., Silva : 54
- (3) TMS : 11
- (4) Personal estimate
- (5) Vidanapathirana : 17

Table 6.5: Estimated Percent of Population with Quantities Anticipated for Settler Population

System Quality	H		C		B		Total	
	1985	Completion	1985	Completion	1985	Completion	1985	Completion
Relative youth: 8 male settlers Age 20-40	64	64	57	74	62	80	61	72
Education: 8 with some schooling	80	80	82	86	80	86	80	84
Agricultural Background	83	83	87	89	84	88	84	86
Pioneering Spirit	77	77	67	85	76	91	75	85
Loneliness	66	66	79	85	70	81	69	77
Adoption of new Techniques	66	66	79	85	70	91	69	77
Proportion of population in 2nd generation	26	26	26	18	25	16	25	20

Based on estimated percent of population in each type of settler group (from Table 6.4) multiplied by the proportion of the total settlement population that each settler group represents (from Table 6.2).

Considering the expectation that settlers would be able to cultivate their holdings with family labor alone, it is by now generally acknowledged that very few families are able to manage without hired labour. For example Siriwardhana (:13) concludes that even though the System H families in his sample had an average of about 7 members, the majority were not able to cultivate their allotments, especially during the peak season, without hired labor (also see TAMS Report : L18). In any event, the key issue is not whether a farm can be managed with family labor alone, but whether the return to the labor of the settler and his family is sufficient to provide an income enough to meet family subsistence needs and more. As was discussed in the agricultural chapter, this does not seem to be the case (see also Section 6.5.5 for further elaboration).

As was indicated in Section 5.5.4, difficulties with deriving an adequate income do seem to be resulting in a significant level of illegal leasing and at least temporary departures from the Mahaweli area. In addition, a number of settlers in areas such as Zone 4 of System C, where irrigation water has yet to arrive, are continuing to "keep one foot" in the wet zone to provide for their livelihood. Nevertheless, with some exceptions such as the Hanguranketa evacuees in System C among whom 61% left the settlement area after one month because they found the living and farming conditions too unsatisfactory, economic difficulties appear not yet to have resulted in a massive abandonment of holdings and outmigration. This is probably the combined effect of a reluctance to entirely give up rights to land and possibly of a recognition by settlers that they may not be any better off anywhere else. In the land of the poor, the man with Mahaweli land is king, even if he cannot make it pay. But a gain to the settler, may still be a loss to the economy if the full economic potential of the investment is not realised.

To repeat - there has been a transfer of land assets to the previously land poor, but it is questionable whether, so far, the majority of settlers have been able to earn more than a subsistence income as a result (see section 6.5.5).

Finally, considering the ethnic composition of the settler population, although no figures are available, MASL officers have reported that until development began in System B, virtually all settlers (whether they are resettlers, evacuees or selectees) have been Sinhalese (with the exception of a few hundred Muslims in System H). Given the location of the development areas and also given that 80% of the settlers to date were an "enforced selection", the predominance of Sinhalese was probably inevitable.

However, as has been noted earlier, these constraints will not apply in the future when 90% of the settlers will be electoral

selectees. Although the need to provide settlement land to the Tamil and Muslim populations has been recognised from the beginning of work on System B, GSL and the Mahaweli Authority have not yet been able to arrive at a settlement formula which is socially as well as politically acceptable to all segments of Sri Lanka society. However, it is understood that the government does have a number of respected citizens working on an equitable solution. In the mean time there is a danger that the wish to meet settlement targets in the absence of such a solution could result in an influx of Sinhalese settlers without adequate consideration of the interests of the minority populations. This could only aggravate an already tense security situation and if it brought about more social disruption, could cause distress to the settlers as well as a further delay in construction progress.

6.4 Staffing, Social Services and Infrastructure

Although System B has had some difficulty with filling "Community Development" positions through the first quarter of 1985 it would appear that most of the "Community Development" staff positions within MEA are filled and that many of the staff have the benefit of several years experience with settlement schemes. Social infrastructure has been planned to conform to national norms and the schools, health clinics, post offices, banks and roads provided have generally been considered satisfactory by the settlers with whom we spoke. Although settlers expressed disquiet regarding the national security situation, they did not report any concerns regarding the incidence of crime and the level of policing. The police interviewed indicated that land disputes were the most frequent cause of problems requiring their intervention.

These land disputes most commonly arise from the fact that settlers have been allotted land which has only been temporarily, and sometimes inaccurately, staked out. This, along with the delay in issuing official permits with precise indications of land boundaries, has opened the way to competing claims for the same piece of land. Consequently there are arguments over the precise location of plot boundaries as field neighbours make mutual accusations of encroachment. This problem has been most acute in System H where people have been settled for more than four years and there is a big backlog of land to be finally surveyed before official permits can be issued. Although in Systems C and B the MEA Manager Lands is making an effort to prevent accurate surveying and permit issuing from falling too far behind, there have already been boundary disputes reported in System B (see System B Progress Review for First Quarter - 1985, in Sinhala). Intra-familial arguments over land use rights and inheritance resulted in at least one death while the evaluators were in Zone H4. Although it was not possible to determine how common such incidents are, it does raise the possibility that, in the absence of alternative employment possibilities, the

pressure to gain the right to cultivate land could seriously raise the level of tension within settler families.

In addition to improvements in the quality and timing of land surveying and the issuing of land permits, certain shortfalls in the provision of settler services need attention. Facilities have not always been completed at the time settlers have brought their families, and those which have been completed have suffered either from incomplete staffing or from relatively inexperienced and less competent staff. Furthermore, delays in obtaining Building Corporation acceptance of new facilities have meant that Health and Education Ministries have at times been unwilling or unable to take over buildings once they are completed. Poor construction quality and poor maintenance (more so in System H than in Systems C and B) has meant that in some cases facilities are already deteriorating. Poor maintenance of facilities will only aggravate the problem of staff recruitment and in the long run this may not only jeopardise the health of settlers and the education of settlers' children, but when combined with the remoteness of Systems B and C, will make it even less likely that professional people will be willing to settle in the area with their families.

6.5 Evaluation of Settlement Implementation and Settler Assistance

6.5.1 Summary of Direct Settler Assistance Provided by MASL

As indicated earlier (section 6.2), land preparation and various sorts of material and financial assistance are provided by MASL to each settler family in order to help them to get established. The composition of the settler assistance "package" and the estimated value of that assistance has varied from system to system and has changed through time within each system. However, in January 1985 a uniform scheme for settler assistance in all systems was established by the Executive Director of MEA. The range of direct assistance and its estimated value are summarised in Table 6.6 (notes for this table are in Appendix 8.4). The land clearing and agricultural assistance are initial contributions to realising the productive potential of the land and they have been reviewed in section 5.3. Homestead establishment assistance and food aid are intended to promote the health and nutritional well-being of settlers and they are discussed in section 6.5.8. The relation between the value of food and settler incomes is discussed in section 6.5.5. But first the general development assistance aimed at creating an appropriate community environment will be assessed.

Table 6.6: On-Farm Assistance Received by Each Settler Family
Estimated Value 1985

<u>A. Land Clearing and Agricultural Development Assistance</u>		Rs.
1. Jungle Clearing and Rough Levelling a/ (per 2 1/2 acres paddy allotment)		9,000
2. Homestead Clearing (per 1/2 acre allotment) b/		375
3. Bund Marking, Bund Forming and Initial Tillage c/		2,500
4. Farm Tools d/		350
5. Homestead Planting Materials e/		200
6. Seed Paddy for First Planting f/		495
Total		<u>12,920</u>
<u>B. Homestead Establishment Assistance</u>		
1. Transport of Household Goods g/		560
2. House Construction h/		1,750
3. Well Construction i/		2,750
4. Latrine Construction j/		405
Total		<u>3,715</u>
<u>C. Food Aid</u>	<u>Period of Settlement</u>	
	<u>1st 12</u>	<u>2nd 12</u>
	<u>months</u>	<u>months</u>
1. World Food Program Aid l./	7,530	11,808
2. Thriposha (1 ration for 6 months + 12 months) r/	672	1,344
3. Milk Powder (1 ration for 6 months + 12 months) m/	<u>270</u>	<u>540</u>
Total	8,472	13,692

See Appendix 8.4 for notes to this table.

Source: Project Coordinators or their Assistants, Systems
H, C and B.

6.5.2 Settler Orientation and Training

With the exception of some evacuees in System H who felt that they were promised far more than they were actually provided, settlers were generally satisfied with the orientation they received prior to settlement.

It has been recommended that resettlers be specifically included in settler orientation - something which appears not to have occurred in System H. We were informed that in Systems C and B the orientation courses, like other settler training programs, are given to "all comers" but that no special effort was made to include resettlers. It was not possible to determine how many resettlers were indeed taking part in these courses. It can be presumed that unless a special effort was made to invite them, resettlers will be under-represented and subsequent dissatisfaction and misunderstandings may arise.

6.5.3 Advanced Alienation

The principle of "advanced alienation" is a good one. Under this scheme settlers, unaccompanied by their families, were to have an opportunity to live and work in their new environment before establishing themselves there permanently. It was anticipated that settlers would participate in the construction of the canals, roads, and other structures and would thereby develop a sense of personal involvement in the project (Project Paper, Phase I, Annex C : 7). However, the experiences in the implementation have been mixed, with difficulties in arriving at a management method which assures both a satisfactory rate of progress and good quality of construction. It was not possible to quantify the numbers of settlers who have and have not benefitted from advanced alienation, but the result of the management problems has been that on one hand contracts have been awarded to private contractors who have brought workers in from outside, thus depriving some settlers of anticipated employment outside the cultivation season and on the other hand delays in downstream development have kept "advanced alienees" waiting for services for protracted periods (this was particularly reported in Zone 2 of System C).

6.5.4 Settlement Pattern

Settlers were generally settled with others from their home area and they have been satisfied with this, as well as with the clustered pattern of settlement. It did not appear that the lack of particular skills was a problem as yet. The selection of skilled settlers was directly observed by the evaluators in Zone 4, System C where the people interviewed included individuals

who are applying their experience in masonry, carpentry and rolling of cigarettes (see Table 6.7) (no data available for Systems H and B; also there is no breakdown of the distribution of skills according to sex, although it is a stated intention to take the skills of settler wives into account at the time of selection).

6.5.5 Settler Incomes and the Timing of Settler Arrival

While careful thought has been given to settlement planning for Mahaweli, the "enforced selection" imposed by the need to provide for resettlers and evacuees has at times meant that the pace of settlement has overtaken the ability of the authorities to provide the quantity and quality of services and physical infrastructure necessary to start the economically weaker members of the population on a firm financial footing. Thus Siriwardhana found that in his sample 4/ from System H:

the majority of settlers started their activities in the unfortunate circumstances of debt and lack of finance for the next cultivation season. Some farmers were compelled to rent or lease out their lands just to overcome the economic hardships created for them during the first season but subsequently they continued in this situation because they could not find a way to escape from the poverty trap that they were caught up in (:29).

Tables 6.8 and 6.9 help to demonstrate the nature of this process. Table 6.8 indicates the possible levels of income that farmers in Mahaweli can expect to achieve per acre in Maha '84/ '85 and Yala '85, depending on their yield, to whom they sell their harvest and on the extent to which they can rely on family labor (the values for these parameters were obtained from the agriculturalist on the evaluation team - see section 5.5.1). This table indicates that the Paddy Marketing Board price can give a net return per labor day at or above the current labor wage rate in the Mahaweli area, even for farmers only obtaining a yield of 60 bushels per acre.

However, what is more important to the individual settler is the total annual family income. The level of this income will depend not only on his yield per acre but also on the extent he is able to cultivate in the year (which, in turn, depends on his access to irrigation water), on the extent to which he can rely on family labor (which, in turn, depends on the time constraints

4/ See pp.4 and 12 of the report for a description of the methodology and sample size.

Table 6.8: Estimated Costs and Returns to Family Labor for Paddy Under Different Production Conditions and Points of Sale
(Per Acre)

per acre	Yield	1.2 Tons 60 bushels/acre				1.6 Tons 80 bushels/acre				2.0 Tons 100 bushels/acre			
		3500 ML	3500 T	3500 PMB	3500 St	3750 ML	3750 T	3750 PMB	3750 St	4000 ML	4000 T	4000 PMB	4000 St
Cost/Price Combination	Cost Rs/acre Rs/Kilo Price	2.00	2.60	3.10	3.70	2.00	2.60	3.10	3.70	2.00	2.60	3.10	3.70
Gross Income		2400	3120	3720	4440	3200	4160	4960	5920	4000	5200	6200	7400
Net Return		(1100)	(380)	220	940	(550)	410	1210	2170	0	1200	2200	3400
<u>Family Income</u>													
a) Only family labor used		600	1320	1920	2640	1150	2110	2910	3870	1700	2900	3900	5100
Net Return per man day		12	26	38	53	23	42	58	77	34	58	78	102
b) Family provides 1/2 the labour		(250)	470	1070	1790	300	1260	2060	3020	850	2050	3050	4250

Notes: Total cost per acre includes Rs. 1700 for 50 person days of labor.

Price received per kilo depends on point of sale as follows.

ML - Price received for crop mortgaged to Money Lender = Rs. 2.00 /kg.

T - Price received immediately after harvest from Trader = Rs. 2.60 /kg.

PMB- Price received on delivery to PMB = Rs. 3.10 / kg.

St - Price received by Farmer with Storage capacity who sells some time after harvest = Rs. 3.70 / kg.

Source of Cost and Price Data: Section 5.5.1 of this report.

imposed by the schedule of water issues), and on the price which he is able to get for his crop (which, in turn, depends on whether he is constrained to sell at a low price because of past debts or because of a lack of storage capacity).

Table 6.9 should be interpreted in relation to subsistence a level of income of Rs 12,000 per year. This estimate for a subsistence income is based on the cut-off point for eligibility for food stamps in 1984 which was derived from an estimated minimum subsistence income (including income in kind) of approximately Rs 1000 per month for a family of five 5/ (personal communication, Deputy Director, National Planning Division of the Treasury). A heavy line has been marked around the incomes which exceed this minimum subsistence level. Among the more striking points which emerge from this table are :

- 1) That a farmer who has an average annual yield of 60 bushels an acre and a 200% cropping intensity (it goes without saying that this could be obtained with a range of combinations of Maha and Yala yields - e.g. Maha, 75 bushels per acre, Yala, 45 bushels/acre, etc), can only earn barely more than a subsistence income for his family if he gets the sort of price for his whole crop that can be obtained without storage. Under any other circumstances (e.g. having to hire some labor, or not having enough irrigation water to harvest his full plot in both Maha and Yala, or getting a lower price, or any combination of these) he will be obtaining less than the government-established poverty line. Unless he (and/or other members of his family) is able to get employment off his own farm he will be unable to avoid becoming indebted. Furthermore, if, as is likely, he becomes indebted to a trader or money lender and then becomes committed to selling his crop at a low price, then, even if he is able to increase his yield to 80 or even 100 bushels an acre, he may find it difficult to earn more than a subsistence income from his farm - particularly if he cannot manage without hired labor. This, therefore, is a graphic illustration of how early set-backs due to low yields and/or unreliable water supplies can drive a settler into a debt syndrome from which it is difficult to escape.

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- 5/ This figure is based on the assumption that 80% of total expenses of low income groups is on food; that a per capita daily consumption of 2200 calories is achieved; and that 84% of these calories are derived from eating rice, flour, sugar and coconuts in the quantities typical of low income consumption patterns.

Table 6.9 :

Family Income by Yield, Point of Sale, Amount
of Family Labor Used and Area Harvested

(Rs)

Acres Harvested per year	Yield	60 bushels/acre				80 bushels/acre				100 bushels/acre			
	Point of Sale	ML	T	PMB	St	ML	T	PMB	St	ML	T	PMB	St
<u>Only Family Labor Used</u>													
1		600	1320	1920	2640	1150	2110	2910	3870	1700	2900	3900	5100
1.5		900	1980	2880	3960	1725	3165	4365	5805	2550	4350	5850	7650
2		1200	2640	3840	5280	2300	4220	5820	7740	3400	5800	7800	10,200
2.5		1500	3300	4800	6600	2875	5275	7275	9675	4250	7250	9750	12,750
3		1800	3960	5760	7920	3450	6330	8730	11,610	5100	8700	11,700	15,300
3.5		2100	4620	6720	9240	4025	7385	10,185	13,545	5950	10,150	13,650	17,850
4		2400	5280	7680	10,560	4600	8440	11,640	15,480	6800	11,600	15,600	20,400
4.5		2700	5940	8640	11,880	5175	9495	13,095	17,415	7650	13,050	17,550	22,950
5		3000	6600	9600	13,200	5750	10,550	14,550	19,350	8500	14,500	19,500	25,500
<u>Family Provides 1/2 Labor</u>													
1		(250)	470	1070	1790	300	1260	2060	3020	850	2050	3050	4250
1.5		(375)	705	1605	2685	450	1890	3090	4530	1275	3075	4575	6375
2		(500)	940	2140	3580	600	2520	4120	6040	1700	4100	6100	8500
2.5		(625)	1175	2675	4475	750	3150	5150	7550	2125	5125	7625	10,625
3		(750)	1410	3210	5370	900	3780	6180	9060	2550	6150	9150	12,750
3.5		(875)	1645	3745	6265	1050	4410	7210	10,570	2975	7175	10,675	14,875
4		(1000)	1880	4280	7160	1200	5040	8240	12,080	3400	8200	12,200	17,000
4.5		(1125)	2115	4815	8055	1350	5670	9270	13,590	3825	9225	13,725	19,125
5		(1250)	2350	5350	8950	1500	6300	10,300	15,100	4250	10,250	15,250	21,250

Source : Table 6.8 - see Table 6.8 for notes regarding point of sale.

- 2) Another point which emerges is how a settler who is forced to mortgage his crop and who is unable (due to illness or some other misfortune) to cultivate his plot without hiring labor may actually confront the possibility of a negative income if he tries to operate the holding himself. This helps to explain why some settlers may feel compelled to lease out the land, albeit illegally.
- 3) There is a clear family income advantage to farmers to stretch out and stagger their land preparation and planting (regardless of admonitions regarding water discipline) if it enables them to rely less on hired labor.
- 4) So long as farmers plant only paddy on their irrigation plots they will have to get two good crops a year and a price at least equal to the PMB floor price if they are to obtain more than a subsistence income from their farm.
- 5) At current production costs and prices paddy farmers can earn more than a subsistence income from 2 1/2 acres of irrigated land provided they obtain a yield of at least 100 bushels an acre for two seasons on their full extent and can sell their crop for the PMB price or better.

The importance of World Food Aid in the period before reliable irrigation is available is clear when it is placed in the context of low income from paddy and a low level of utilization of homestead plots for production of nutritious foods (section 6.5.7). In the first year, when an average settler can expect to have at most one harvest (possibly rainfed) of paddy and under optimistic conditions (80 bushels per acre yield with crop sold to PMB) the cash value of his crops will be Rs 7275 (Table 6.9). The addition of World Food Program assistance valued at Rs 8,472 (Table 6.6) effectively brings family income to Rs 15,747 - above the subsistence level. This is fine so long as during the period of WFP assistance the foundations are laid for farmers to independently earn a greater than subsistence income after WFP aid is terminated (usually after the first harvest).

Fortunately, 90% of the remaining settlers are to be selectees from the electorates. This will enable the authorities to take a more measured approach to settlement - first ensuring that resettlers are adequately provided for and are among the first to benefit from the irrigation structures with the availability of reliable irrigation, then bringing in selectees only when they can be assured not only that they will receive irrigation in their fields within 6-9 months ^{6/}, but that the land that they are assigned is productive enough to provide more than a subsistence income under average standards of management.

6/ Given the availability of World Food Aid as a source of supplementary food, it may be acceptable for settlers to rely on the Maha rains for their first crop provided irrigation water is assured for the next Yala crop.

6.5.6 Turnout Groups Foster Community Participation

The settlers interviewed generally had few complaints about turnout groups, but underlying their response there seemed to be an attitude of indifference toward the groups existence. This indifference seems to be indicative of a fairly passive attitude toward the actions and the activities initiated by the Mahaweli Authority. The respondents tended to await directives, having encountered, in their view, little encouragement for their own initiatives. Settlers felt that decisions regarding timing of water availability, reliability of water delivery and cropping patterns are all made from above with little substantive participation on the settlers part.

Although there is a formal recognition by the Authority that settlers may have ideas to contribute, settlers expressed the view that if they deviate from the norms and patterns set by the Authority, their suggestions and requests are not treated as worthy of consideration. Some settlers were of the opinion that their participation, through turnout groups, farmer leaders meetings, etc. was requested merely to meet the formal requirements of a quorum, not to hear settlers opinions and requests. Many settlers have come to the conclusion that their problems can only be solved through individual intervention in patron/client relationships rather than through group action.

As far as other community organisations are concerned, this is an area where official MASL instigation will, at best, be ineffectual. Where common needs have been identified by the community, groups have been formed to meet them - e.g. Funeral Aid Societies, or informal pilgrimage groups. Where common needs have not been recognised by the settlers and where MASL representatives have attempted to generate group activities, these efforts have generally met with little long term commitment on the part of the settlers. What is most important and what some settlers felt was lacking is a willingness by the Authority to respond to and support the settlers own initiatives. It should be recognised that the immediate lack of settler group initiatives probably reflects the fact that in the Mahaweli settlement program, most needs are met on an individual basis and there is very little advantage to be derived from membership in formal groupings. The stronger members of the community can use personal contacts to get what they need and therefore have little interest in working in a group. The weaker members lack the influence and ability to function as a cohesive group.

6.5.7 Support for Women

So far "Support for Women" has taken the form of family health and maternity services, limited training, primarily for younger

women, through the Home Development Centres, and the provision of Day Care Centres offering child care for a small proportion of the population. Our field observations suggest that very few women are actually being seen by Family Health Workers or Health Midwives. Although there is an impressive and innovative deployment of Health Volunteers, they are inadequately supervised with the result that much of the potential to be derived from the system is lost (see section 6.8.2.1 for recommendations for improvements).

Regarding training for women the provision of a well balanced program including agricultural skills as well as health, nutrition and sewing to 400 young women in Home Development Centres in System H4 and to 113 young women in System C is to be commended. These trainees may prove to be change agents in their communities. But the available evidence indicates that few if any of these trainees have been able to use their skills for income generation.

It was not possible to do a careful examination of the nutritional and income benefits that settler families are deriving from their homesteads, but casual observation suggested that the majority are not realising the full potential of this land. One common complaint was the lack of water to regularly cultivate vegetable crops which can significantly improve family nutrition. It has also been observed that "a lack of motivation, ignorance to potential, lack of knowledge and experience of marketing has left ... women with a general attitude of apathy to home gardening...." (Perera : 17). There still does not appear to be an aggressive program involving all agricultural extension workers, towards homestead development and the provision of technical advice and inputs which will enable women to manage their homesteads more efficiently and productively and have beneficial consequences for family nutrition. It is essential that a study be made on the costs and benefits currently being derived by settler families from their homesteads in order to identify and take action to alleviate the principle constraints to their better utilisation.

It was not possible in this evaluation to determine the impact of day care centres either on the children participating or on releasing mothers to engage in activities which they could otherwise not have undertaken. However their absence was reported by some female respondents to be the biggest impediment to their formation of informal associations and attendance at training programs.

Provision of Health Services, Food Aid and
Homestead Establishment Assistance

For the resettlers, Mahaweli development has meant a real improvement in their access to health services (cf. baseline surveys for H4 and H5 by Ranatunge, et.al.:27; and for B by Silva: 38). In general, there appears to be no significant difference in the health status of settler families as compared with that of those who live in remote areas of other parts of the country: however this observation is impressionistic only as there are no separate data available for the AMP area on morbidity and mortality to provide verification. Settlers in the AMP areas have the benefit of the normal Ministry of Health infrastructure, augmented by the Health Volunteer Service which provides for one volunteer per 50 families in System H and one volunteer per 25 families in System C. In System B the Health Volunteers are currently being trained and their services are to be made available to settler families very shortly. Experience so far indicates that more has to be done to make Health Volunteers an integral part of the Health Care System rather than a marginal, and generally unrewarded, adjunct.

Given these resources, the level of services reaching the settlers could be greatly improved by better supervision, monitoring and better administration generally. Family Health Workers were found to demonstrate a low level of familiarity and contact with the population under their care. The need to improve the level of contact with the people they are to serve was suggested in the observation that 58% of mothers interviewed neither knew nor had seen either a Public Health Inspector or a Family Health Worker. Yet more than half of those who had not been seen by these officers were either lactating, pregnant and/or had children under 5 years of age.

Other areas requiring investigation are the complaints by some Health Volunteers of inadequate supplies of spirit, cotton wool and Disprin, the complete absence of child delivery facilities in System C, and the lack of dental health facilities in all three systems.

It was impossible to do a careful evaluation of nutritional indicators in the project area. However, it would appear that the level of chronic malnutrition, while significant, is comparable with levels found elsewhere in the country. It is worth noting that the Interim Report of 1981 prepared by the Food and Nutrition Policy Planning Division found that the "relative neglect of subsistence food production in contrast to rice and other cash crops (such as chillies (GAN) has a noticeable effect on the family's diet, the nutritional value of which has decreased over the years, as reflected in reports on

the nutrition of women and children in low income groups" (cited in Perera : 23).

The importance of food aid as a family income supplement before the commencement of irrigated crop production was demonstrated in section 6.5.5. cursory observation indicated that the distribution of World Food Program commodities and of thripasha to mothers and children under five is being satisfactorily administered, although there are reports of irregularities. A full evaluation of World Food Program assistance in the Mahaweli area can be found in the WFP and MASL report of 14 February 1985.

Lack of safe drinking water and hygienic sanitation are persistent problems in the three systems. Well and latrine construction have been chronically behind schedule (See Table 6.10) and their absence, as well as problems with wells going dry, have contributed to the high and debilitating incidence of gastro-intestinal diseases in the area. Serious efforts are being made to increase the construction of wells and latrines, and to provide community tube wells where shallow wells are proving to be inadequate. A greater success might be achieved if there were better communication between the Public Health Inspectors and Family Health Workers (who are supposed to care for and educate settler families), the Health Volunteers (who apparently owe their loyalty to the Unit Managers), and the Unit Managers and Community Development Officers (who are responsible for supplying the well and latrine construction materials).

While malaria continues to be a serious problem, the combined measures of spraying with malathion, distributing prophylactic tablets and providing quinine tablets to those affected, are helping to control the disease. It would appear that with adequate surveillance and treatment, some settlers have, in time, become less affected by malaria. This emphasises the importance and effectiveness of a sustained effort to control the disease. No solution has yet been found to the temptation to sell malathion for uses other than anopheles control.

The Mahaweli Authorities have provided a useful service in offering settlers some material assistance and guidelines for improving the design and quality of their houses, but the extended occupation of "temporary" houses indicates that until settlers begin to experience a sustained increase in their income, it is unlikely that the majority will make the changes recommended so far.

An important defect affecting settler health which was found during home visits was the inadequate provision of light and ventilation in settler houses. Of the 46 houses visited, almost 90% did not have adequate light and ventilation. This can be a

Table 6.10: Progress of Well and Latrine Construction

	Year Settlement Started	Number of Settlers to 31 March 1985 *	Number of wells Constructed •	Number of Latrines Constructed
H (Galnewa)	1976-1977	12,751	1,599	NA
H 4	1979	8,874	1,079	4,626
H 5	1979	6,112	501	NA
C (Zone 2)	1981	4,382	2,398	3,841
C (Zone 3)	1982	2,025	370	1,734
C (Zone 4)	1983	3,367	543	2,505
B (Zone 1)	1983	3,911	798	761
B (Zone 2)	1984/85	816	-	-
B (Zone 5) (including Pimburettewa)	1982	2,676	200	589

- In System H figures for wells constructed only include community wells. Complete figures are not available for private wells which have been constructed. Figures for System H are to 31 Dec. 1984.

Note: Not all sources of figures clearly distinguish by type of well (open well, tube well, community well, private well) or indicate whether figures reflect wells and latrines completed and in use or partially completed, or for which materials have been simply provided.

Source: System H - Progress of Construction of Community Wells in 'H' Area as at 31.12.84 prepared by "B de S".
 - Latrines in H4 - From Project CDO
 System C - Monthly Progress Reports tabulated by PMU
 System B - Monthly Progress Reports tabulated by PMU

contributing factor to the spread of respiratory infections and other infectious diseases among the members of the family. This observation is particularly significant in view of the fact that many settlers in System H appeared to still be living in their original "temporary" houses. Even in System C, where settlers were offered a Rs. 1500 refund on the cost of house construction, 70% of the settlers interviewed by the socio-economists were still living in their original wattle and daub houses. It is accepted that to some extent housing quality reflects differing priorities and some settlers have built good quality houses for themselves. But these appear to be the minority (See Table 6.11).

This indicates that most settlers have, for some reason, not considered the MASL housing guidelines suited to their resources and/or preferences. The reason for this should be investigated and more appropriate designs developed.

6.6 Economic Differentiation, Effective Demand and Employment

The employment opportunities generated by the opening of new lands and the temporary availability of construction jobs have undoubtedly provided a temporary safety valve for national unemployment in Sri Lanka. They have also enabled some, though not all (cf. section 6.5.3), settlers to supplement their farm income from off-farm employment. It is not possible to estimate how significant this supplementary income has been because no data are available to determine what proportion of settlers have been so employed, nor the average frequency and duration of such employment, nor what the average annual income has been from off-farm employment.

The Mahaweli Authority is very conscious that employment associated with construction activity cannot be depended on to absorb future labor surpluses. More must be done to stimulate employment generating investment in the Mahaweli area. Special programs are now being prepared to promote such investment and USAID is providing technical assistance for the planning of these programs. It can only be reiterated here that such programs are most important, and they must be supported by a thriving agricultural sector. The past experience in System H has demonstrated how weaknesses in the farm economy have stifled regional economic growth.

Data available from System H4 (see Table 6.12 - comparable data are not available for other areas) indicate that the number of boutiques, small traders, and paddy mills has increased significantly between 1978 and 1985 (with most of the increase occurring after settlement in 1980-82). However, these developments must be analysed in relation to their likely contribution to future employment. A study on the build-up of the

Table 6.11 Condition of Settlers' Houses

	Year Settlement Started	Number of Settlers to April 1985	Number of Houses				
			Permanent	Semi Permanent	Temporary	Total	
H (Galnewa)	1976-1977	12,751	1,000	557	6,267	7,824	
H 4	1979	8,874	1,680	2,981	2,965	7,626	
H 5	1979	6,112	NA	NA	NA	NA	
C	1981	9,774	-	-	9,141	9,141	
B (Zone 1)	1983	3,911	152	2,634	1,124	3,910	
B (Zone 2)	1984/85	816	-	119	697	816	
B (Zone 5)	1982	2,676 *	35	934	1,711	2,680	
Excluding Total - H5		-	38,813	2,867	7,225	21,905	31,997

* Includes 1382 settlers from Pimburettewa Colonisation Scheme

Source: RPM's office in each System, May 1985. Inconsistencies cannot be explained.

Criteria for classification not specified.

Mahaweli economy by the People's Bank can be extrapolated to suggest that the growth of retail shops and small service centres will have been generated by an immigrant population growth and do not necessarily represent the beginning of a dynamic and diversified economic development.

Table 6.12 : Increase in the Number of Selected Businesses -
System H4 - Thambuttegama 1978 to 1985

	1978 (1) No.	1985 (2) No.
Petrol Stations	1	2
Paddy Stores (Govt. & Pvt)	3	55
Paddy Mills (large & small scale)	20	79
Bakeries	10	29
Brick making and Brick sale	1	5
Saw Mills & Timber Sales	1	3
Handloom Centres & Textile Shops	1	15
Pottery Centres	9	38
Jewellery Making Centres	2	2
Motor Vehicle Repair Shops	6	8
Motor cycle and Bicycle Repair Shops	16	51
Furniture Shops	N/A	35
Hotels and tea shops	N/A	48
Boutiques	N/A	202
Blacksmith	N/A	7
Fruit and Vegetable Stalls	N/A	28

Source:

- (1) Ranatunga et.al.:29
- (2) RPM's office, Thambuttegama

A generally low level of production and incomes may have merely resulted in the spread of a subsistence income.

Having said this, it should be acknowledged that a minority of settlers have had the good fortune of having the capital, technical knowledge and quality of land to weather early settlement difficulties. It is likely that the result of the presence of these two groups has been a commercial structure which follows the pattern the People's Bank characterised as follows:

Low income situation - Geographical Dispersal of Similar Shops

- Low agricultural output/off season - less money (Cash) for the people - less mobile and more dependent on credit - nearby shops important - many small shops run with excessive labour sell essential items - inter-dependent socio-economic patron/client relations between shopkeepers and farmers (p.48).

Small shop keepers were found to run on low capital with little access to credit and to have profits comparable to farm incomes.

High income situations - Geographical Concentration and Hierarchy Formation

- High agricultural output/season - more money to spend, increased mobility and tendency to spend more, especially on non-essential items, independent of credit - nearby shops disregarded in favour of "fashionable shops" - relatively independent farmers, accumulation of trading surplus in few places, diversification of trade, high regional leakages (ibid).

The regional leakages are particularly important because so long as the investable surplus that is generated leaves the area, few jobs will be created locally. Yet without such jobs, there is every indication that the problem of land subdivision, and presence of growing numbers of landless unemployed will be repeated as it has been in Gal Oya and Minipe, to name but two examples. This emphasises the importance of a broadly based increase in purchasing power where the majority of settlers, rather than a favored few who concentrate wealth, are able to enjoy an income above subsistence.

6.7 Economic Differentiation and Leasing - A Focal Area For Monitoring and Evaluation of Socio-Economic Development

The Mahaweli Authority, through its various agencies and through the PMU, generates an impressive amount of data on the plans and progress of its activities. The ability of the authority to implement a venture as large and complex as the AMP is a tribute to its capacity to digest and use this information to positive effect.

There has been a tendency, perhaps necessary in the initial construction phase, to present figures and undertake analysis of settlement progress in terms of numbers of "settlers", "plots", "wells", "latrines", etc. This has obscured the differences between settlers and may have at times encouraged the misapprehension that a single solution to any given problem will affect all settlers uniformly. The consequence of such a misapprehension can be that a minority are positively affected while the majority are either not affected or even adversely affected.

It would appear, for example, that already a minority of settlers in System H - those with capital (e.g. from compensation or from trading interests), good land and access to water have been in a position to appropriate for themselves services and inputs which may have been in short supply (Tilakasiri : 26; Siriwardene : 12; Siriwardhana: 54). The relative strength of this minority combined with the economic vulnerability of the majority of settlers and the setbacks associated with poor weather, unreliable irrigation, and inadequate marketing have already precipitated leasing, (as has been reiterated above) often with tenancy to merchants who may not be interested in making optimum use of the land. Low productivity and low income have in turn reduced effective demand, and undoubtedly stifled economic growth and inhibited employment creation in the region.

The rate of land concentration and differentiation may be reduced in Systems C and B, but only if settlers are not exposed to the same economic adversities as those faced by settlers in System H. Even then it can be anticipated that some settlers will want or have to give up their land. Rather than being legally prevented from doing so, those who wish to lease their land should be given some form of safeguards, such as an informal land lease registration procedure, which ensure that the weak are not taken advantage of.

The precise policy which would achieve this aim can only be developed if there is a clear understanding of the circumstances surrounding land leasing. One contributing factor was suggested in section 6.5.5 but so far only impressions, often conflicting, are the most common basis for the discussion of the prevalence and significance of leasing in the Mahaweli area. It is time that those participating in leasing arrangements are carefully monitored to determine if and why certain types of settlers are tending to sell or lease their land, to whom they are selling or leasing, and how the land is being subsequently used. This may prove to be the most sensitive and effective indicator of the socio-economic impact and equity of the AMP.

One factor which could complicate the informal registration of leasing agreements and which, as has been mentioned earlier (section 6.4) is already contributing to disputes within Mahaweli communities is the delay in final surveying and issuing of land permits. A concerted effort should be made by the Authority to ensure that surveying and permit issue lags no more than a year behind settlement.

7. THE MAHAWELI SECTOR SUPPORT LOAN

7.1 Background and Purpose

The Mahaweli Sector Support Loan (MSS) was designed in 1981 as an innovative effort to deal with extraordinary budget and inflationary pressures faced by the government of Sri Lanka (GSL) following its courageous economic liberalization program. The liberalization program was designed to induce more rapid and more equitable growth by stimulating investment, employment, and agricultural production. The Accelerated Mahaweli Program (AMP), a vast and ambitious program by any standard, was a center piece of this effort, but its very size also contributed to the inflationary pressures and the foreign exchange drain which confronted the government since the early 1980s.

Foreign donors responded enthusiastically to the AMP program. The bulk of foreign assistance made available financed the dams, major canals, and other major structures connected with the program. Aid was available to a lesser extent for the development of the so-called "downstream" activities needed to prepare the newly irrigated areas for agriculture and for habitation, and to actually move the settlers into the new areas and to get them started in their new life.

Given the financial constraints faced by the government in 1981, there was a danger that these downstream activities would be underfinanced - leading to a stretch-out of the program, to postponement of the production and income benefits to be obtained from the irrigation portion of the program, and to disillusionment, dissatisfaction, and outright hardship on the part of the settlers. All or any of these consequences would have had serious consequences for the ultimate success of the AMP. In order to forestall this eventuality, the U.S. government proposed a flexible Sector Support Loan in the amount of \$50 million to provide a source of non-inflationary financing for the "downstream" activities of the AMP.

7.2 The MSS Concept and Plans

The concept was to provide local currency budget support, to the extent that no other donor financing was available, for selected downstream projects of the AMP. This was to be accomplished through the reimbursement of actual expenditures incurred by the Mahaweli Authority of Sri Lanka (MASL) for these projects. At least 25% of each project was to be financed by the GSL or other donors. Local currency funds were to be generated by financing

imports from the United States on the basis of Unrestricted Special Letters of Credit (USLC). A subsidiary objective of the MSS was to increase imports from the United States.

The loan was to be quick disbursing both on the rupee and on the dollar side and to be completed by June 30, 1984. The Mission was to review proposed GSL budget allocations for downstream activities each fall, prior to the submission of the budget to Parliament, to determine the amount of support needed for the target activities. Agreement was to be reached with MASL on the projects to be supported and on the amount of U.S. financed rupee support to be provided for each project.

Monitoring was to be accomplished by the Mission through the review, on a quarterly basis, of progress and financial reports, supplemented by field spot checks on the accuracy of these reports. The GSL was required to maintain suitable reports and accounts to enable subsequent audits to confirm that funds were actually spent for the designated projects.

7.3

The MSS in Operation

In practice, rupee reimbursement has proceeded at a slow pace during most of the loan period and there have been additional delays in effecting dollar reimbursements to the GSL. It became necessary to extend the operation of the loan by one year to June 30, 1985, and a major effort was made by both MASL and the Mission to complete the loan on time (see Table 7.1 for a record of expenditures under the Loan).

The delay of rupee reimbursement was due to a number of factors. Firstly, there were communication problems within the USAID Mission and between the Mission and the GSL. Instructions governing the reporting requirement, the format of reimbursement requests, and specification of eligible items were not agreed upon until eight months after the loan was signed. Then MASL needed more time than originally contemplated to adjust to the requirements of the reimbursement procedures, and revised eligibility requirements reduced the rate at which reimbursements could be made. Secondly, utilization of MSS funds was slowed by the availability of greater amounts of other donor funds (IDA, EEC, etc.) than may have been anticipated when the MSS was signed. Since the use of other donor funds is, as a rule, more restricted, MASL preferred to use these funds first and prudently conserved the more flexible MSS funds. Thirdly, System B (LB) - one of the main targets of U.S. interest and of the MSS - was slower in getting under way than originally planned. At the same time, planned MASL activities were left undone or postponed because of the slow disbursement of MSS funds.

Table 7.1 : MAHAWELI SECTOR SUPPORT PROJECT - RECORD OF EXPENDITURES JUNE 1981 - DEC. 1984

Period of Claim	AMOUNT IN S.L. RUPEES		AMOUNT IN U.S. DOLLARS		Exchange Rate
	Budgeted by MASL	Approved by USAID	Payments by USAID	Payments To date	
<u>1981</u>	<u>(340,000,000)</u>	<u>(175,416,956)</u>	<u>(8,483,589)</u>		
June - October	226,666,667	88,564,000	4,236,501	4,236,501	20.90
November - December	113,333,333	86,852,956	4,247,088	8,483,589	20.45
<u>1982</u>	<u>(313,000,000)</u>	<u>(228,687,787)</u>	<u>(10,046,790)</u>		
January - June	156,500,000	87,652,452	3,866,451	12,350,040	22.67
July - December	156,500,000	141,035,335	6,180,339	18,530,379	22.82
<u>1983</u>	<u>(405,000,000)</u>	<u>(216,851,696)</u>	<u>(8,737,421)</u>		
January - March	101,250,000	30,050,322	1,245,867	19,776,246	24.12
April - June	101,250,000	35,891,453	1,439,112	21,215,358	24.94
July - September	101,250,000	47,313,573	1,898,619	23,113,977	24.92
October - December	101,250,000	103,596,348	4,153,823	27,267,800	24.94
<u>1984</u>	<u>(512,830,000)</u>	<u>(352,337,068)</u>	<u>(13,415,100)</u>		
January - March	128,207,500	111,167,269	4,352,673	31,620,473	25.54
April - June	128,207,500	23,488,648	919,681	32,540,154	25.54
July - September	128,207,500	65,344,906	2,500,762	35,040,916	26.13
October - December	128,207,500	152,336,245	5,642,083E	40,682,999E	27.00E

E : Estimated

Note: Payments through December 1984

Source: USAID

Considering the eligibility requirements, a factor contributing to a slow rate of MSS utilization arose from MASL uncertainty about how an audit trail could be established for MSS funds. To forestall subsequent refund claims from USAID, MASL reimbursement requests identified specific items to be financed with U.S. aid. This would not only reduce possible audit problems but it would also provide a reporting framework for MASL record keeping. However, the MASL procedure raised questions in the minds of USAID officers regarding the possibility that U.S. procurement and marking requirements, which would have been contrary to the basic objective of the loan, may have to be applied. To forestall this possibility, a 25% limitation was imposed on each line item, thus further limiting the scope for reimbursement.

Moreover, the limitations on eligible types of expenditures not only increased the financial burden on the GSL and slowed down reimbursement, but also added to the complexity of loan administration. Reimbursement was limited, inter alia, to expenditures for construction; a limitation which was not foreseen either in the PP or the Approval Memorandum to the AID Administrator. This limitation has, in recent months, been interpreted liberally by permitting the reimbursement for expenses in connection with land clearance and land preparation, as well as for electricity and fuel purchases. Nevertheless other current expenditures were declared to be ineligible. It is noteworthy in this connection that the GSL budget classifies all "downstream" expenditures as "capital" or "development" expenditures which should therefore have been eligible for reimbursement under the MSS as originally conceived.

The opening of the letters of credit was then further delayed because USAID decided to pre-audit the reimbursement requests, and carried out field inspections prior to payment in some cases. These audits might well have been performed after the dollar reimbursement, leaving possible adjustments for later, in connection with subsequent reimbursement requests.

7.4

Impact of the MSS

Activities to be reimbursed under MSS were selected in the Colombo headquarters on an ex-post basis. Our investigations indicated that MASL officers in the projects we visited were largely unaware of the existence of the MSS and of the procedural requirements connected with it. However, this does not appear to have prevented MSS from achieving its objectives.

It is clear from an inspection of the budgets of the MASL, of MEA, of MECA and of the projects we visited and from our conversations with senior budget officials that the amount

allocated for each project at the beginning of each fiscal year was heavily influenced by the availability and allocation of MSS rupee funds and was not thereafter affected by the pace of reimbursement.

For example during the last complete fiscal year, when the MSS was the most important source of reimbursement rupees for the AMP (a fact which MASL plans to recognize in its next report), MASL was able to demonstrate to the Finance Ministry its ability to relieve the GSL budget. Although the 1985 MASL budget request was initially reduced by the Finance Ministry by about one billion rupees, this reduction was substantially restored on the basis of assurances that about 70% of the restored funds would be reimbursed from aid programs including, in particular, funds from the MSS program (see Table 7.2 for the evolution of the MASL budget). It is clear from this observation that the MSS achieved its primary objective -- of assuring that required local currency funds would be available for downstream activities on a timely basis.

This leaves the question whether the MSS helped to contain inflation, the other main objective of the loan. Additional demand created by MASL expenditures has only a partial impact on the balance of payments, and to the extent that it does, it was presumably offset by imports, since these are largely liberalized. The impact of increased demand on domestic bottlenecks, such as construction, is not likely to be reduced significantly by the availability of foreign exchange. Thus the inflationary impact of MASL expenditures was reduced only to the extent that it was possible to do so through the provision of foreign exchange. The extent of the anti-inflationary impact of the MSS (and of food aid and of other program type loans) was, of course, affected by the pricing of the imported commodities and by the exchange rate.

In the short term, the effect of MASL expenditures on the balance of payments was a decline of official foreign exchange reserves, pending reimbursement from the MSS. The GSL authorities were able to tolerate this decline in reserves because of the availability of firmly committed balances of food aid and program aid which could be treated as a line of credit and could serve as secondary reserves for all analytical (and practical) purposes.

It is clear therefore that all the major objectives of the MSS were accomplished despite the slow pace of reimbursement and foreign exchange recovery. Nevertheless, the long pipeline creates a picture, albeit exaggerated, of inefficiency and of untidiness. A picture such as this damages the concept of this kind of assistance and therefore needs attention if sector assistance is to have support in the future.

Table 7.2: Evolution of Mahaweli Budget for 1985
(Rs. millions)

	<u>PIP</u> <u>83/87</u>	<u>PIP</u> <u>84/88</u>	<u>Revenue</u> <u>Estimates</u>	<u>Operational</u> <u>Budget</u>
Total Capital Budget	5728	6845	5492	6568
Foreign Aid Component (of which reimbursement)	3444	4570	3568 (900)	4277 (1643)
GSL Funds	2284	2275	1924	2291

Note: 1985 Request by MASL was 6.5 billion rupees according to Mr. De Mel, Finance Director, MASL.

Sources: Public Investment Plan for 1983-1987
Public Investment Plan for 1984-1988
Revenue Estimates, Finance Ministry, 1985
Operational Budget MASL, 1985

Utilization of Foreign Exchange

Turning finally to the question of the impact of the MSS on increasing the value of U.S. exports, here the effects appear to have been negligible. This is true primarily because dollar funds were used to finance import transactions retro-actively and therefore did not encourage new purchases. It is our understanding that Ceylon Central Bank regulations authorize discounts for importers who use aid financing for their purchases. We could not establish why MSS dollars were used to pay for imports which had already occurred instead of making the funds available to finance import prospectively. This procedure imposed a significant administrative burden on the Central Bank which the Bank would like to avoid in the future.

One possible reason for retro-active financing was a fear that given the low level of past imports from the U.S. and the general unfamiliarity of Sri Lankan importers with U.S. markets, the utilization of the funds might be unacceptably slow. If this is the case, it may be necessary to provide technical assistance -- or interest U.S. export promotion agencies -- to identify categories of U.S. products suitable for import to Sri Lanka, to acquaint Sri Lankan importers with these products, and to explain specifications and other procedural aspects related to U.S. exports and markets. This approach has worked in other countries where utilization of program assistance was slow partly due to the unfamiliarity of local importers with U.S. markets and U.S. marketing practices.

Adequacy of AMP Downstream Local Currency Budgets

The MSS has clearly made a major contribution to monitoring a high level of budget availabilities for downstream activities. This level was high enough so that MASL was not prevented by financial considerations from doing anything downstream that it wanted to do. Whether the downstream budgets were "adequate" is more difficult to answer. Mission management determined the adequacy of budget allocations for the targetted downstream activities by reviewing the MASL work programs and budgets. Progress reporting indicated that work programs were not carried out in many cases, and MASL reporting data cannot be used without considerable data manipulated as a basis for management decisions. It does not, for example permit ready adjustment of work plans and of budgets in the light of unplanned changes in progress.

Table 7.3: Mahaweli Budget Planning
(Rs. millions)

	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
Mahaweli Capital						
Expenditures PIP 83-87	6773	7271	5785	4753	5315	-
Foreign Aid	4886	4771	3444	1940	936	-
Mahaweli Capital						
Expenditures PIP 84-88	-	6017	6845	5672	1919	734
Foreign Aid	-	4000	4570	3979	1442	479

Source: PIP 1983 - 1987
PIP 1984 - 1988

7.7 Overall Assessment of the Effectiveness of the MSS

Senior MASI finance officials have stated unequivocally and justifiably that the MSS has been uniquely useful to them by helping to secure increases of budget allocations for the AMP and by its flexibility. Despite the persistence of administrative problems on both the GSL and the Mission side, the loan successfully achieved its main economic and financial objectives. The original concept was well suited to accomplish the objectives sought. Adherence to the detailed procedures laid down in the PP and the accompanying memorandum to the Administrator would have avoided most of the operational difficulties which were encountered.

A recent draft audit report suggested that resort to either cash grants or to a commodity import program (CIP) would have been more effective. This is incorrect, mostly for the reasons stated in the PP and the Approval Memorandum counselling against such a course. The reimbursement procedure for the MSS focusses attention on the GSL budget process and requires GSL to decide on the allocation of its anticipated resources, some of which may come from taxation and others from borrowing including foreign aid. The need to seek reimbursement creates internal pressures to improve administration of the loan. In contrast, the CIP procedure would focus considerable administrative attention on the dollar side, on how to generate rupees. Moreover, if rupees are generated prior to expenditure, as is the case with either the CIP or with cash grants, there may be more of a possibility of domestic resources being transferred to purposes other than those intended by the assistance.

7.8 Requirements for Additional Local Currency Financing

As noted in Section 3.3 of this report the availability of MSS funds for Zones 1 and 5 appears to be ending when they are most needed. In addition a case could be made for additional flexible assistance to finance local costs needed in the consolidation phase of Systems H and C and for an expanded maintenance effort needed for all aspects of the downstream program. Most importantly, additional resources are required for increased efforts to promote regional development, off-farm employment, and to improve farm incomes beyond the subsistence level through improved farm gate prices, storage, marketing, transport and so forth.

Donor financing in the past has tended to stress capital projects. This approach supports a very high level of GSL capital expenditures which is seen by the GSL and by other observers as one of the main causes of the intolerably high budget deficit. The deficit, in turn, is one of the main factors contributing to

financial instability, causing inflation, balance of payments problems and squeezing the private sector. Therefore, a strong argument can be made on economic grounds for an increased flow of flexible assistance similar to the MSS to finance local costs. This is also consistent with the recommendations of the World Bank.

This evaluation has found that MASL financial and progress reporting has improved and is clearly adequate to account for local currency funds allocated to its budget and to provide a satisfactory audit trail. MASL has also initiated a training program to teach improved budgeting, accounting and reporting techniques and procedures to senior field management and accounting staffs. This should prepare these staff for an increased role in reimbursement activities under the various aid programs. The O&M technical assistance team could also be helpful in this process but more of its attention will need to be devoted to budgeting and accounting in the early phase of the contract than appears to be the intention at the present time.

It should therefore be possible in connection with any future loan to dispense with the detailed project accounting, contract identification, and pre-audit requirements that caused so many problems and delays in connection with the MSS. The GSL would of course run the risk of facing refund claims if subsequent audits do not confirm expenditures for the purposes designated. This risk could be reduced if the Mission continues to make spot checks to assure that fiscal records are in order and that physical progress reflects the overall financial effort. In this connection we understand that the Controller has previously examined the adequacy of MASL record keeping and we would suggest a continuing role for the Controller.

Despite the misgivings expressed in section 7.7, the CIP approach is an alternate possibility. The Mission would need additional analysis of GSL import patterns and the temporary help of a commodity specialist to determine whether sufficient - and possibly additional - imports from the U.S. could be generated using this procedure. Such a program should be limited to commodities which are to be sold commercially since imports for use on government projects do not generate any local currency. Capital imports for government projects may thus escape the normal scrutiny applied to such projects by donors and by the GSL Finance Ministry when GSL resources are needed. An exception might be made, within specified limits, for spare parts and equipment needed for maintenance purposes, to encourage this type of effort.

It is understood that the GSL and the Mission are considering a PL-480 Title III program as an alternative approach, or as a supplement, to sector support loans, in order to provide non-

inflationary rupees to finance activities which promote agreed development objectives. Subject to the reservations expressed in the previous paragraph, such an approach should accomplish the desired objectives assuming that care is taken to assure that commodities are appropriately priced and that consumption patterns are not changed in a way which would be difficult for GSL to sustain without long term concessional aid. Care is also needed in programming the use of such local currencies in relation to the total amount of resources needed for a given program lest changes in the rate of flow of imports or in the availability of GSL resources result in a net reduction of the total program effort, contrary to what was intended by both parties.

Finally it is important for all concerned to keep in mind that the basic problem creating the so-called local currency problem is the low domestic savings rate and GSL inability, for policy and structural reasons, to generate a reasonable amount of domestic resources for development and investment. Foreign aid can help bridge the gap but the gap will widen or development will slow unless domestic resource mobilization is improved.

7.9

Economic Considerations

Food and program aid are valuable resources capable of making significant contributions to development if they are used in the appropriate policy framework. The nature of the structural and policy changes needed in SL are mostly recognized by the GSL and have been discussed at length in GSL policy documents and in reports by the World Bank and other donors. They were no doubt discussed at the June meeting of the GSL with aid donors in Paris. These reforms need not be elaborated here.

It is worth noting however that food and program aid can turn into a palliative enabling the recipient government to postpone needed reforms. Without reforms such aid is less effective and therefore more costly to both donor and recipient. The level and effectiveness of food and program aid are particularly affected by the pricing of imported commodities into the economy and by the speed and thoroughness with which proceeds are collected. Donors therefore need to consider carefully the balance between providing financing for high priority investment activities and the possibility that such financing exacerbates the structural problems impeding development. The low capital output ratio in Sri Lanka suggests that action is urgently needed lest the heavy donor investments are dissipated.

The reform package being discussed may involve a requirement for temporary balance of payments relief including structural adjustment loans and program aid. All this indicates the need for

close coordination between GSL and the donors in developing the best modalities and time phasing to improve the effectiveness of aid and to accelerate the speed with which the massive capital programs now under way result in additional output and incomes.

7.10 Procedures for Future Food and Program Aid Efforts

U.S. aid administrators should endeavour to minimize the burdens on already over charged officers and administrative systems in the country. Thus, USAID reporting requirements should be met primarily from data ordinarily collected by host governments. Analytical and reporting focus should be on the program and budget unit used by the host government, recognizing that U.S. provided local currency will usually constitute a minor role in the overall resource picture.

It is also important for the Mission to bring all its resources to bear in the planning and administration of such local currency programs. Economists and program officers as well as the controller can play a useful role and their early and deeper involvement in the MSS might have avoided some of the problems that arose. Inasmuch as local currency programs involve important questions of budget priority and resource allocation responsibility for such programs is frequently placed in the Program Office. The Program Office usually has the experience and background to deal with these issues and routinely has close relations with the Finance and Planning Ministries, which normally have the final authority to settle such issues.

8. APPENDICES

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B.2 SCOPE OF WORK FOR MAHAWELI EVALUATION

ARTICLE 1 - SCOPE OF WORK

I. The Evaluation

A. The projects to be evaluated are:

1. Mahaweli Basin Development Phase I USAID Project, 383-0056;
2. Mahaweli Basin Development Phase II USAID Project, 383-0073; and
3. Mahaweli Sector Support Project USAID Project, 383-0078.

B. Evaluation Methodology

The contractor will serve independently as a member and coordinator of the evaluation team which will include a representative of the Mahaweli Authority of Sri Lanka (MASL), project officers, three team members contracted through and IQC and local specialists, contracted by the IQC contractor. The evaluation will begin on/a March 18, 1985 and extend to on/a May 25, 1985. The time for the evaluation provides approximately three weeks in the field and seven weeks in Colombo. The last two weeks in Colombo will include reporting to USAID and MASL and final printing and publishing of the team's evaluation. The individual members of the IQC team will finalize their portions of the report, final debriefing and departure from Sri Lanka.

C. The Scope of Work will be used by the coordinator as a basis for developing an approach and detailed evaluation program. The approach and evaluation program will be agreed with the AID project officers and presented to the IQC team members for their review and concurrence.

D. Evaluation Purpose

1. The evaluations are to be undertaken to analyze and assess the performance and results of the three projects including the degree to which the project purpose has been accomplished and the effectiveness of the USAID/GSL inputs and resulting outputs of the three projects.

2. The Mahaweli Basin Development Project Phases I and II midterm evaluation is to be undertaken in March/May 1985. The evaluation is to provide information relating to the effectiveness the USAID contributions are having in assisting the GSL in meeting the project goals of reducing unemployment, increasing food production, providing land to the poor and landless, meeting settler needs, and providing services to settlers. In addition, the evaluation is to determine if satisfactory implementation progress is being made toward completing those parts of the project being financed by the GSL and/or other donors and to assess the likelihood of GSL financing for the remainder of the project.

3. The evaluation of the Mahaweli Sector Support Project is an end-of-project analysis and will be undertaken in conjunction with the above midterm evaluation. The evaluation will analyze USAID/GSL actions to provide an objective and rational basis for determining the success of this type of project and to assist in appraising the viability of this or a similar type project for use in the future.

II Evaluation Questions:

A. GENERAL

The conclusion and recommendations should be supported by verifiable data and/or personal observation to the maximum extent possible. Where verifiable data is not available the contractor should so state and indicate whatever other basis was used in reaching judgements regarding the project achievements and impacts.

The reports will address the following questions:

1. Have planned inputs been put in-place and on the schedule in the implementation plan for each of the projects?
2. What is the status or accomplishment of planned outputs?
3. Have there been major changes in project assumptions (political and socio-economic conditions, GSL priorities, etc.), which have affected planned project activities?
4. After assessing inputs and outputs, what indication is there of impact (accomplishment of purpose) in the three projects? Are there indications that anticipated End-of-Project-Status (EOPS) conditions have been reached?
5. Are the projects responsive to the development needs as presented in the project papers and how can lessons learned be incorporated into the current or future projects?

B. MAHAWELI BASIN DEVELOPMENT PHASE I

1. Have there been any major changes in the Left Bank Canal design since construction began?
2. Has the construction supervision and monitoring been adequate in the USAID funded and the GSL funded portions of the project.
3. What is the status of the environmental portion of this project.?
4. What technology transfer and institution-building has been provided by the project.?

C. MAHAWELI BASIN DEVELOPMENT PHASE II

1. What is the implementation progress toward attainment of the objectives of the project in the areas of: a) resettlement of farm and non-farm families in the project area; b) construction of the main and branch canals; c) construction of the tertiary irrigation system; d) on-farm development-land clearing, levelling, bunding, and terracing; e) road construction; f) provision of social infrastructure and services (i.e., schools, banks, health centers, postal services, telecommunications, community development and training centers, water wells, latrines, townships, blockcenters and hamlets); and g) agriculture production facilities and services (i.e., administration centers, markets, stores for agricultural inputs, agricultural credit and extension services)?

2. What facilities and services are available for operation and maintenance of the various aspects of the project (i.e., irrigation system, roads, farm system, etc)?
3. What is the status of water management, water user organizations, agriculture extension and research?

D. SECTOR SUPPORT PROJECT

1. Are the contributions through the Sector Support Project being utilized, as projected in the Project Paper to maintain an adequate level of local currency investment in the Mahawell program?
2. Are the USLC's being fully utilized to finance goods and services from the U.S? Does it have a beneficial impact on Sri Lanka's balance of payments?
3. What did we achieve using this mode of assistance? Are there other modes of assistance that would have been more effective in achieving the projects objectives?
4. Is this a model other projects should follow in the future? What modifications should be considered for other projects of this type?

IV Team Composition:

A. The evaluation team will consist of:

1. An expatriate Rural Development Specialist (Team Coordinator) contracted by USAID on a personal services contract (PSC).
2. Three other expatriate specialists, viz. an Engineer, a General Agriculturist/ Agronomist and an Economist/Financial Analyst, to be contracted by AID under an IQC work order.
3. Local consultants as needed in agriculture economics, health and education; office space; vehicles; secretarial services; printing and publishing all draft and final reports; and all administration costs are to be included in the IQC.
4. One or two GSL representatives to assist the team in evaluation analysis, data collection and setting up meetings with appropriate GSL offices in Colombo and in the field and assist with logistical arrangements, e.g., lodging in the field; four wheel drive vehicles; data analysis, etc.
5. USAID project officers will provide overall evaluation guidance.

B. RESPONSIBILITIES OF TEAM MEMBERS:

1. General

- a. Team members will review project papers, loan and grant agreements, and other official documents related to the three projects e.g., loan and grant amendments, project implementation letters, baseline studies, feasibility reports, audit reports, monthly reports, etc.;

b. Meet with appropriate agencies, e.g., MASL, MEA, MECA and other agencies, as necessary for background interviews and to identify field trip inspection requirements.

2. Rural Development Specialist: (USAID contracts-PSC)

a. The rural development specialist will be the coordinator for the evaluation team. The coordinator's work shall begin about two weeks prior to the arrival in Sri Lanka of the three member IQC team. The coordinator shall be responsible for: setting up meetings; make arrangements for vehicles, word processing, etc; arrange preliminary dates for field trip; with GSL and AID, identify GSL counterparts; identify and collect, to extent possible, all relevant documents to the evaluation etc.

b. Review planning criteria for settlement including settlement policies and their implementation, services and infrastructure to be provided;

c. Field inspection trip to Systems B,C, and H. Meet with MEA field personnel to discuss planning and implementation of settlement, e.g., settler infrastructure, services, etc.

d. Field trip to selected township, block center and hamlet in Systems C and H, but will concentrate on all settlement and related activities in System B. Meet and interview settlers, area doctors, family health workers, teachers, credit representatives, services representatives, etc.

e. Assess settlement activities and prepare evaluation report covering the three project areas individually, e.g., Systems B,C and H. Make recommendations for improvement, if any.

3. Engineer (IQC Firm):

a. Review design drawings, construction drawings, other contract documents and other official reports for Phase I and Phase II;

b. Field inspection trip to Maduru Oya Left Bank Irrigation Project, to System H, System C and Kotmale and Victoria Reservoir road areas;

c. Review and appraise; progress of U.S. contractors in System B and spot check areas of GSL funded activities under Mahaweli Basin Development Phase II and local construction reimbursed under the Sector Support project in Systems B,C, H and the peripheral roads at Kotmale and Victoria e.g., roads, wells, latrines, and physical infrastructure, etc., in Systems B,C, & H.

d. Prepare evaluation report covering the three projects individually. Make recommendations for improvement, if any.

4. Agriculturist/Agronomist (IQC):

a. Review available agriculture documents and schedules related to Systems B,C, & H pertaining to agriculture policies and implementation with emphasis on extension, research, cropping practices, animal husbandry, production, marketing, credit and

agriculture economics.

b. Meet with appropriate officials of the Mahaweli Authority, Department of Agriculture and the Land Use Division of the Ministry of Lands and Land Development to ascertain direction of implementation activities, e.g., settlement progress, agriculture and related services availability, etc.

c. Field inspection trip to three project areas, Systems B,C, & H, to meet with field staff and farmers.

d. Assess the agriculture and income status of the Mahaweli farmers.

e. Prepare evaluation report on three project areas. Make recommendations for improvement, if any.

5. Economist/Financial Analyst (Q/C Firm):

a. Review the economic setting of the Mahaweli Sector Support (MSS) program and assess whether the MSS was an appropriate assistance instrument given that setting.

b. Review the GSL administrative capability and assess whether the MSS was an appropriate assistance instrument given that capability.

c. Review AID's design and implementation of MSS and determine if either could have been improved.

d. Review GSL implementation of MSS.

e. Review the current economic and GSL administrative setting and recommend appropriate assistance modes other than the traditional AID project mode.

f. Provide an assessment of the GSL financing for completing Mahaweli Basin Development Phase II Project and assess availability of GSL financing for completing the project on schedule.

g. Prepare evaluation report on three projects, as required, and make recommendations for improvement, as necessary.

.. Methodology and Procedures:

A. The general methodology for the evaluation shall be as presented in AID Handbook 3, Chapter 12. The evaluation shall assess the actual outputs of the project with relation to the outputs assumed in the project paper and specifically how accomplishments or outputs has contributed to achievement of the project purpose (EOPS). It will also review project design/redesign during the course of the project, assess changes in the project setting, define progress to date (i.e., physical, financial, participation, benefit incidence) and define lessons learned to be used by others with similar projects.

B. The evaluation will be a collaborative effort between USAID, the GSL and the evaluation team contractors. The contractors will be briefed by USAID and the GSL at the beginning of the evaluation. A USAID officer(s) will be involved in the evaluation process on a continuing basis. The contractors will brief the USAID and GSL 1) prior to departure for the field inspection trip; 2) at completion of the field trip; 3) at completion of the first draft of

the evaluation; 4) and after incorporating all first draft comments and preparing a final report. Additional briefings may be included as determined to be necessary.

C. At the presentation of the first draft to the GSL and USAID, the contractors will present all fact findings, issues and probable recommendations for consideration during the first draft review.

D. The evaluation team will follow the program evaluation section within Article 6 of the Loan and Grant Agreement and the basis for evaluation will be the Project Paper and Annex I, Amplified Project Description for each project, i.e., Mahaweli Sector Support, Mahaweli Basin Development Phases I and II.

E. The duration of the evaluation will be about six weeks in Sri Lanka for all IQC contractor's team members. The Coordinator will be available two weeks prior to and two weeks after the IQC team members are in Sri Lanka. The Coordinator will do preparatory work prior to the IQC team's arrival and will complete the final report after the IQC team members leave Sri Lanka. Individual team members will complete their reports prior to departure from Sri Lanka.

F. USAID concurs in a six day work week for the evaluation team.

G. The anticipated schedule for evaluation is as follows:

1. The coordinator/rural development specialist begins work o/a March 18, 1985
2. Preparatory work - 18 to 30 March, 1985 (Coordinator)
3. Coordinator finalizes briefings and meetings, April 1-5, 1985
4. IQC team and Coordinator begin work o/a April 22, 1985
5. Collection/review of data,
Meetings and briefings - 22-27 April, 1985
6. Field inspection trip - 29 April 18 May, 1985
7. Report draft and briefing - 20 -to 25 May, 1985
8. Review draft - 27- 29 May, 1985
9. Final Revision - 30 May to 1 June, 1985
10. Final debriefing - 3 June, 1985
11. IQC team departs - 4 June, 1985
12. Printing/Distribution of report (Coordinator)- 4 - 15 June, 1985

H. Information/Documents available for review to determine project impact include:

1. Mahaweli Sector Support Project.
 - PP and Loan Agreement with Project Implementation letters
 - MECA/MEA Annual proposed/actual work plans
 - Invoices
 - Unrestricted Special letters of credit information
 - Reports on actual work performance
2. Mahaweli Basin Development Phases I and II.
 - Baseline Study
 - PP and Loan and Grant Agreement with Project Implementation letters
 - Consultant's/contractor's contracts
 - Consultant's/contractor's reports
 - USAID Review Report June 1983
 - Invoices

- Contractor's construction schedule
- Audit report for Phase I

V Reports

A. General-The contractor will participate in the preparation of the draft evaluation report of each project which will include a list of written materials reviewed, persons interviewed regarding the evaluation, project activities observed and pertinent observations regarding the status of project implementation.

B. The contractor will prepare and submit his/her own evaluation reports for each of the three projects as required in accordance with the evaluation schedule.

C. Reports prepared to meet the purpose of the evaluation shall contain all pertinent findings, analysis, conclusions and recommendations.

D. Each report will contain the following sections:

1. Executive Summary: Maximum of two pages per project, single spaced, including statement of purpose of the AID project(s) reviewed and of the evaluation,
2. Basic Project Identification Data Facesheet,
3. Statement of Conclusions (short and succinct with topic identified by subhead) and Recommendations (corresponding to conclusions and worded, whenever possible, to specify who, or what agency, should take recommended action),
4. Body of Report: Includes description of the country context in which the project was developed and which provides the information on which the conclusions and recommendations are based, and
5. Appendices: Include scope of work, methodology description, proposed recommendations for improving future evaluations, and information relevant to the body of the report.

E. Five copies of all draft reports for each project will be submitted to USAID for review.

F. Twenty copies of the final project evaluation report for each project will be submitted to USAID.

ARTICLE 2 - PERIOD OF SERVICE

The contract period is for approximately 62 workdays, commencing on/about March 18, 1985 and ending on/about June 15, 1985.

ARTICLE 3 - SUPERVISION AND CONTACT

The contractor will work with the IQC firm under the direct supervision of the Chief, Mahaweli and Water Resources Development.

8.3 LIST OF PERSONS CONTACTED 1/

USAID/Sri Lanka

Frank Correl	Director
William Schoux	Deputy Director
Leroy Purifoy	Chief, Mahaweli and Water Resources Development Division (MWRD)
Gilbert Haycock	Project Officer, Phase I, II (MWRD)
Dr. Joe Thanarajah	Engineer, MWRD
Anne Dammarell	Evaluation Officer, Program Office
D.R.R. Samaranyake	Economist, Program Office
Dan Scarfo	Deputy Chief, Project Development and Special Programs
Michael Korin	Chief, Agriculture and Rural Development (ARD)
Senaka Abeyratne	Agricultural Economist (ARD)
Dr. Walter Abeygunawardene	Agricultural Consultant

Ministry of Mahaweli Development

Col. I. Samarawickrama	Secretary
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M.A.S.L. (Colombo)

K.H.S. Gunatilleke	Director General
P.T. Senaratne	Deputy Secretary General
N.A. de Mel	Financial Coordinator
Dr. A. Attanayake	Director, P.M.U.
A. Cooray	Settlement and Irrigation Engineer, P.M.U.
N.H. Bowditch	Enterprise Development Advisor

M.E.A. (Colombo)

D.K. Eandaragoda	Executive Director
C. Amarasinghe	General Manager
D.W. Kannangara	Consultant/Marketing and Credit
H.M.S. Walgampaya	Manager Projects
M.S.A. Cader	Manager/Finance
T.S. Jayawardene	Manager/Lands
B.K.D.S. Samarasinghe	Manager/Business Development & Marketing
C.de Saram	Consultant/Draught Animal and Dairy Development Program
J.L.W. Ameresekera	Chief Marketing Officer

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1. This includes principal contacts above block level.
Contacts at block, unit and farm level are too numerous to list here.

M.E.A. (Colombo) (cont.)

P. Ranatunge	Chief Training Officer
M. Jansen	Environmental Officer
G.W. Liyanage	Senior Agronomist
D. Buddhadasa	Senior Agronomist
M. Galpoththage	Agronomist
L. Devasiri	Agronomist
W.W. Udupihalla	Chief Equipment Engineer
H.A. Wickremaratne	Chief Irrigation Engineer
C.A. Fernando	Project Coordinator, System B
P.H.K. Dayaratne	Project Coordinator, System C
L.P. Perera	Project Coordinator, System H

M.E.C.A. (Colombo)

N.G.R. de Silva	Chairman
H.D.S. de Alwis	Director, System B
T.P. Ranasinghe	Director, System C
C. Liyanage	Director (Personnel Administration)
A.D. Kurupita	Director (Finance)
W.S. Hulugalle	Director (Administration)

System B

P. Seneviratne	Resident Project Manager	MEA
K.B. Jayasinghe	Deputy Resident Project Manager	MEA
K.T.R. Sumanasuriya	Project Officer, Lands	MEA
W.G. Hemapala	Project Training Officer	MEA
U.L. Wickremasinghe	Project Agricultural Officer	MEA
M.A.B. Dhamaratna	Project Marketing Officer	MEA
S.G. Ariyapala	Project Coordinator, Resident Engineer	MECA/B/I
U.S.K. Pitawela	Project Resident Engineer, Package 2N/ADB Roads	MARD

Berger/IECO

A.C. Gates	Construction Manager, Phase I and II
R.E. Dixon	Construction Engineer
R.M. Gibbons	Office Engineer
T.M.J. Tennakoon	Materials Testing Engineer (Resource Development Consultants)
H.B. Cooke	Materials Engineer

System C

V.P. Pathirana	Resident Project Manager	MEA
M.D.M.H.B. Divaratne	Deputy Resident Project Manager, Lands	MEA
H.K. Sathyapala	Special Studies Officer	MEA
K.G.B. Abeywardena	Project Community Development Officer	MEA
H.M.W. Weerakoon	Project Marketing Officer	MEA
N.A.G. Hettiarachchi	Project Agricultural Officer	MEA
W.M.U. Chandrasena	Manager, Livestock Farm, Girandurukotte	
Dr. H.H. Upasena	Deputy Director, Agricultural Research Station, Girandurukotte	

T.B. Ranatunga	Agricultural Officer, Demonstration Farm, Girandurukotte	
D.A. Handapangoda	Deputy Resident Project Manager (Water Management)	MEA
B. Chandrasena	Irrigation Engineer, Zone 3	MEA
C.B. Basnayake	Resident Project Director	MECA
L. Nirodhawardane	Div. Resident Engineer, Zone 4 (South)	MECA

System H

J. Jayawickrema	Resident Project Manager, Galnewa	MEA
U.K. Sumanadasa	Dep. Res. Project Manager, Community Services, Galnewa	MEA
M. Karunatilaka	Dep. Res. Project Manager, Agriculture, Galnewa	MEA
S.A. Samarasekera	Project Community Development Officer, Galnewa	MEA
G.G.W. Gunetilleke	Dep. Res. Project Manager, Water Management, Galnewa	MEA
K. Vidana	Dep. Res. Project Manager, Community Services, Thambuttegama	MEA
A. Jayasinghe	Dep. Res. Project Manager, Agriculture, Thambuttegama	MEA
N. Vijithasena	Project Community Development Officer, Thambuttegama	MEA
R.M.D. Chandarasekera	Project Community Development Officer, Thambuttegama	MEA
J. Jayasingha	Progress and Monitoring, Thambuttegama	MEA
R.B. Dissanayake	Resident Project Manager, Nochchiyagama	MEA
S.D.A. Samarasinghe	Dep. Res. Project Manager, Community Services, Nochchiyagama	MEA
Mr. Ramboda	Dep. Res. Project Manager, Agriculture, Nochchiyagama	MEA
D.P. Wickramasinghe	Project Community Development Officer, Nochchiyagama	MEA
D.B. Rambodageder	Program and Budget, Nochchiyagama	MEA
P. Weerakody	Project Irrigation Engineer, Nochchiyagama	MEA
R. Wijetunge	Manager, Niraviya Livestock Farm	
M.R. Fernando	Resident Project Director	MECA
J. Fernando	Deputy Director M.I. Research Farm	DO Agr.

Victoria and Kotmale

Mr. Aruliah	Chief Resident Engineer, Kotmale	CECB
D. Yapa	Road Engineer, Kandy Region	DOH

Other Contacts

Dr. M.P. Dharmapala	Deputy Director, Research, Batalagoda Central Rice Research Station	
Dr. Tom Wickham	Director General, International Water Management Institute	
Warren Leatham	Project Manager, Gal Oya Water Management Project	

Other Contacts (Contd)

Dr. Percy Silva
Dr. G.H. Peiris
Dr. Nalini Somanasundere
Dr. Tudor Silva
Dr. S.W.A.R. Samarasinghe
Dr. N.F.C. Ranaweera

Robert Chaffers
Peter Schumann
R.W. Manning

Dept. of Geography, Univ. of Colombo
Dept. of Geography, Univ. of Peradeniya
Dept. of Geography, Univ. of Peradeniya
Dept. of Sociology, Univ. of Peradeniya
Dept. of Economics, Univ. of Peradeniya
Div. of Ag. Econ. & Projects, Dept.
of Agriculture, Univ. of Peradeniya
CIDA/Ottawa
UNDP/Bangkok
Coopers and Lybrand

a) Jungle Clearing and Rough Levelling

Undertaken by the MEA in the past, but to be taken over by MECA. The estimated cost varies according to the jungle density. The following cost ranges were budgeted for 1985 in Systems C and B for a 2 1/2 acre area.

<u>System</u>	<u>Minimum</u> (Rs)	<u>Maximum</u> (Rs)
C	5,000	9,000
B	3,500	11,500

b) Homestead Clearing

Cash payments to the settler. This is only offered in System C.

c) Bund Marking, Bund Forming and Initial Tillage

Bund marking and initial tillage are undertaken by MEA and the cost estimate only covers fuel. The settler is given a cash payment between Rs 500 and Rs 800 for bund forming.

d) Farm Tools

This includes one each of the following:

mamoty, alavangoe, axe and knife.

e) Homestead Planting Material

Tree seedlings for mango, coconut, jak fruit, banana, orange. The combination depends on soil type and climate and is decided by the RPM in consultation with the agronomist.

f) Seed Paddy for First Season

For 5 bushels of seed.

g) Transport of Household Goods

Undertaken by the MECA for evacuees, or by MDB for early settlers in System H. MEA provides one lorry-load of transport to the settlement area for electoral selectees and within the area for resettlers who need to move from their existing homes. The cost is an estimated average value to cover fuel only based on the Senapura budget (System B) of Rs 750,000 for 1,340 settlers in 1985.

h) House Construction

In System B roof tiles are supplied to this value. In

System C settlers are either reimbursed for materials to this value or roof tiles are supplied to this value.

i) Well Construction

To cover the cost of MEA supplied well rings or cement and bricks plus some labour payment (the latter in C only). This does not include the pro-rata cost of community wells of various sorts which are provided in each system or of the bowsered supply of water until well water is available (the latter are particularly important where wells have gone dry and where granite layers have made shallow wells inappropriate).

j) Latrine Construction

To cover the cost of MEA supplied lavatory plate plus the labour of latrine construction.

k) World Food Program Aid

Food is issued once per month. Settlers unaccompanied by their family can receive a single ration for a maximum of 6 months. As soon as their family arrives they can receive a 5 person family ration for a maximum of 15 months in System C and a maximum of 18 months in System B. The cost estimate is based on a settler receiving a single ration for 6 months and a 5 person family ration for 18 months.

Table 8.1: Calculation of Value of World Food Program Settler Ration

Commodity	Single Ration				Family Ration (for 5 people)			
	Daily Ration (gms)	Monthly Ration (Daily x 30)	Price/kg * (Rs)	Value/Month (Rs)	Daily Ration (gms)	Monthly Ration (Daily x 30) (gms)	Price/Kg * (Rs)	Value/month (Rs)
Wheat Flour	400	12000	12	144	30 x 5	45000	12	540
Pulses (dhal)	30	900	25	23	25 x 5	3750	25	94
Dried Fish	40	1200	50	60	20 x 5	3000	50	150
Sugar	20	600	13	8	10 x 5	1500	13	20
Edible Oil	30	900	40	36	30 x 5	4500	40	180
Total Value/month				271				984

* Estimated June 1985

	Rs.
Value of Ration : First Twelve Months (6 months single, six months family)	7530
Second Twelve Months (12 months family ration)	11808
<u>TOTAL</u>	<u>19338</u>

1. Thripposha - For children under five years of age and lactating or pregnant mothers. Assume there is one eligible person per family.

Ration - 50 gms/day = 1.5 kg/month
@ Rs. 70/Kg = Rs. 112/mo/family

m. Milk Powder - For children under five years of age and lactating or pregnant mothers. Assume there is one eligible person per family.

Ration - 30 gms/day = 900 gms/month
@ Rs. 50/Kg = Rs. 45/mo/family

8.5 EVALUATION METHODOLOGY AND RECOMMENDATIONS

FOR FUTURE EVALUATIONS

8.5.1 Evaluation Methodology and Timetable

The evaluation team report is an aggregate of the individual chapters prepared by each team member. The research method used has been developed as appropriate to each subject matter and is described in the relevant chapter. The justification for an integrated report for the three projects and the general approach used is described in Chapter 2.

The full evaluation team was in Sri Lanka for approximately six weeks, commencing work on 29 April 1985 and departing from Sri Lanka on 11 June 1985. Prior to the arrival of the three team members from the IQC contractor (International Science and Technology Institute, Inc.) the Socio-economist undertook approximately two weeks of document collection and preparation of logistical arrangements in collaboration with the MWRD Project Officer.

After the arrival of the other team members an initial ten days of document review and discussion in Colombo was followed by approximately two weeks in the field, visiting various research stations and upstream engineering sites as well as Systems H, C and B (in that order). The period in System B was limited to only two days because of disturbances in the area. On return from the field the team spent a week and a half in follow-up interviews in Colombo and report writing. Each team member submitted a draft of their respective chapter for review by the relevant USAID staff, and was responsible for incorporating the comments received into their own chapter prior to their departure. The Socio-economist then spent an additional three weeks completing the final editing and publication of the report. The author of each chapter is responsible for the substantive content of his/her respective chapter.

8.5.2 Recommendations for Improving Future Evaluations

The evaluation team benefitted greatly from the experience and depth of knowledge (impossible to gain in only a few weeks' exposure to a program as large and complex as the Mahaweli) provided by the USAID staff, PMU staff and the Sri Lankan field team. However, the six weeks available for familiarisation with the program, field observations, report writing and report revision did not offer enough time for an in-depth assessment of

the program based on an evaluation of all the primary data which could be available. All that was pragmatically possible was a broad brush over-view of the general situation.

Projects of the size and importance of Phases I and II will merit a very careful preparation of the final evaluation with work initiated at least six months before the deadline for evaluation completion. The evaluation design and implementation should be undertaken in close collaboration with the PMU/MECA/MEA. It would also be desirable to consider a combined effort with other donors operating in System B, to reduce overlap and avoid repeated evaluation demands on MASL.

An evaluation team should be contracted for a three phase program. During the first phase (of about a month) the team would work with USAID and PMU on the preparation of a carefully worded and focused scope of work. After a short field reconnaissance, the team would prepare a detailed plan of work with an identification of the specific data which will be required and of how it will be generated. Data to be compiled and tabulated by USAID and MASL would be specified and a field survey program would be designed and initiated.

In the second phase (of about three months) one member of the design team would remain on contract to coordinate with USAID and MASL on the data which they will generate and to supervise the execution of the field survey and the initial tabulations.

In the third phase (of about two months) the full evaluation team will review and interpret the data which have been collected. The team will present a first draft report to USAID and then, after revision, make the final draft available to MASL for their comments and suggestions. The entire team will be responsible for the incorporation of these observations in the final report.

As an immediate measure, both MWRD/USAID and PMU/MASL should compile and then continue to update at least quarterly, a comprehensive catalogue of reports and monitoring data which have been prepared (at least) for System B. It may be appropriate for USAID to consider contracting a librarian/archivist to help set up a, preferably computerised, cataloguing system. Among the documents which the USAID "Mahaweli Library" should include as a basic reference source for future studies and evaluation is the People's Bank Bibliography on Mahaweli (first prepared in 1982 and currently being up-dated).