

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE

C A = Add
C = Change
D = Delete

Amendment Number
1

DOCUMENT CODE
3

COUNTRY/ENTITY

SRI LANKA

3. PROJECT NUMBER

383-0073

4. BUREAU/OFFICE

ASIA

04

5. PROJECT TITLE (maximum 40 characters)

MAHAWELI BASIN DEVELOPMENT, PHASE II

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)

MM DD YY
019 | 31 | 08 | 6

7. ESTIMATED DATE OF OBLIGATION
(Under "B" below, enter 1, 2, 3, or 4)

A. Initial FY 81

B. Quarter 2

C. Final FY 85

8. COSTS \$1000 OR EQUIVALENT \$1 =

A. FUNDING SOURCE	FIRST FY 81			LIFE OF PROJECT		
	B. FY	C. L/C	D. Total	E. FY	F. L/C	G. Total
AID Appropriated Total	20,750	4,250	25,000	91,300	18,700	110,000
(Grant)	-	-	-	2,490	510	3,000
(Loan)	20,750	4,250	25,000	88,810	18,190	107,000
Other U.S. 1.						
U.S. 2.						
Host Country	-	6,542	6,542	-	111,999	111,999
Other Donor(s)	-	-	-	-	29,000	29,000
TOTALS	20,750	10,792	31,542	91,300	159,699	250,999

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROXIMATE YEAR	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) FN	0200	060	060	-	68,000	3,000	22,000	3,000	107,000
(2)									
(3)									
(4)									
TOTALS					68,000	3,000	22,000	3,000	107,000

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

010 020 030

11. SECONDARY PURPOSE CODE
B-100

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code BR BL BS ENV EQTY
B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

Development of the area of System "B" of the Accelerated Mahaweli Program lying along the Left Bank of the Maduru Oya (River)

14. SCHEDULED EVALUATIONS

Interim MM YY MM YY Final MM YY
0 | 6 | 8 | 3 | 0 | 6 | 8 | 4 | 0 | 6 | 8 | 6 |

15. SOURCE/ORIGIN OF GOODS AND SERVICES

000 941 Local Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a page PP Amendment.)

Project Funds (AID Financed) increased \$25 million from \$85 million to \$110 million consisting of \$3 million grant and a \$22 million loan.

17. APPROVED BY

Signature

Title

Date Signed

MM DD YY
1 | 0 | 2 | 0 | 8 | 3 |

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM DD YY

PROJECT AUTHORIZATION AMENDMENT

SRI LANKA

Mahaweli Basin Development Phase II
AID Project No.383-0073
AID Loan No.383-T-028/A/B/C

Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, the Project Authorization is hereby amended:

(a) to increase planned obligations over the life of the Project from not to exceed \$85,000,000 to not to exceed \$107,000,000 in loan funds and to add not to exceed \$3,000,000 in grant funds, both subject to the availability of funds in accordance with the A.I.D. OYB/Allotment process,

(b) to provide that, except as AID may otherwise agree in writing:

(1) commodities financed under the grant shall have their source and origin in Sri Lanka or in the United States,

(2) except for ocean shipping, the suppliers of commodities or services financed under the grant shall have Sri Lanka or the United States as their place of nationality, and

(3) Ocean shipping financed under the grant shall be only on flag vessels of the United States.

The authorization cited above remains in force except as hereby amended.

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GLOSSARY

ACRES	Acres International Limited
ADAB	Australian Development Assistance Bureau.
ADB	Asian Development Bank.
AID/W	Agency for International Development/Washington.
AMP	Accelerated Mahaweli Development Program
Berger/IECO (B/I)	Louis Berger International Inc./International Engineering Co. Inc.
CH2M Hill	CH2M Hill Inc.
CPM	Critical Path Method.
D-Channel	Distributary Channel.
EEC	European Economic Community
Ganga	A river which does not go dry.
GSL	Government of Sri Lanka.
ID	Irrigation Department.
Maha Season	Cultivation season generally lasting from November through February. In the project area this is the time of monsoonal rains.
MASL	Mahaweli Authority of Sri Lanka.
MED Phase I	Mahaweli Basin Development, Phase I.
MBD Phase II	Mahaweli Basin Development, Phase II.
MEA	Mahaweli Economic Agency, a (department of MASL).
OPEC	Organization of Petroleum Exporting Countries
Oya	A river with very low or no flow for part of the year

O&M	Operations and Maintenance.
PACD	Project Authority Completion Date.
PC	Project Committee.
PP	Project Paper.
Purana	An existing or traditional village is referred to as a Purana Village.
TA	Technical Assistance.
USAID/AID	United States Agency for International Development Colombo.
Yala Season	Cultivation season lasting from May to September a very dry period in the project area.
Z/D	U.S. Joint Venture firm of Zachry/Dillingham.

PROJECT PAPER SUPPLEMENT
MAHAWELI BASIN DEVELOPMENT PHASE II
AID PROJECT NO.383-0073

1.0 RECOMMENDATIONS AND SUMMARY

1.1 Recommendations

The Mahaweli Basin Development Phase II project (MBD Phase II), as amended by this PP Supplement, remains financially, economically, technically, administratively, socially and environmentally feasible. It is recommended that:

(a) the total costs of the project be increased from \$203.6 million to \$251.0 million;

(b) AID authorize an additional \$25.0 million for the project thereby increasing AID's contribution from \$85.0 million to \$110.0 million, including:

(i) an additional loan amount of \$22.0 million to finance increased construction costs of main and branch irrigation canals and to provide required equipment for operation and maintenance;

(ii) a grant of \$3.0 million to finance a new technical assistance package to support the system.

The \$3.0 million grant should be obligated in FY 1984 and the \$22.0 million loan should be obligated: \$8 million in FY 1984 and \$17.0 million in FY 1985. The recommended terms of the loan are repayment of the principal and payment of interest in U.S. dollars within 40 years including a ten year grace period of repayment of the principal with interest at two percent (2%) per annum during the grace period and three percent (3%) thereafter.

1.2 SUMMARY

MBD Phase II currently provides loan finance for main and branch irrigation canal construction of a major portion of System B in the GSL's Accelerated Mahaweli Program. System B encompasses the Left and Right Banks of the Maduru Oya river in the east-central dry zone of Sri Lanka, and the project area of MBD Phase II constitutes approximately 75,000 hectares of the Left Bank.

Total costs of the project were estimated in the original Project Paper to be \$203.6, subsequently revised to \$218.2 million in the Project Loan Agreement. Both the PP and the Loan Agreement provide for \$85 million in AID loan funds for main and branch canal construction. The remainder of \$133.2 million, as reflected in the Loan Agreement, is being met by the GSL from its own resources, by other donor contributions, and by reimbursements under USAID's Mahaweli Sector Support project (383-0078), with the caveat that non-reimbursed GSL contributions remain at a minimum of at least 25% of total project costs.

Other direct USAID support for System B development is provided under the Mahaweli Basin Development Phase I project (383-0073). This predecessor project finances a host country contract with the joint venture association of

Louis Berger International Inc. and International Engineering Co. Inc. (Berger/IECO). Under its contract, Berger/IECO (a) has designed the irrigation system for both the Left Bank and Right Bank of System B, and (b) is providing the engineering supervision for the Left Bank construction financed by MBD Phase II.

An important milestone was reached in July, 1983 when the Maduru Oya headworks dam was inaugurated. This structure and its reservoir will control the flow of irrigation water into System B and was built with Canadian assistance. The Left Bank system financed by AID under MBD Phase II remains scheduled for completion by the original PACD of September 30, 1986. The Right Bank system will be developed at a later date.

The project was authorized by the Administrator on April 11, 1981 and obligated in the initial amount of \$25 million on May 29, 1981. Three subsequent amendments to the Project Loan Agreement have increased the amount obligated to \$68 million. Bids for the construction contract were received in April 1982 and a host country contract was awarded by the GSL in May 1982 to the joint venture of H.B. Zachry Co. and Dillingham Construction International Inc. (Z/D). The contractor commenced work on site in June, 1982.

The Z/D contract was bid and awarded based on a division of the total Left Bank construction (Phase 1) into two phases, denominated Phase 1(a) and Phase 1(b). Phase 1(a) encompasses Zones 1 and 5 of the Left Bank system which are the zones geographically closest to the start of the main canal and which are served by the first set of right and left branch canals. Phase 1(b) includes the remainder of the Left Bank system financed under the project (Zones 2, 3 and part of 4 which lie further along the main canal).

To date, \$68 million has been obligated and committed to the Z/D contract for Phase 1(a) construction costs. Z/D was the low bidder on the contract at \$91.9 million (divided \$63.1 million for Phase 1(a) and \$28.8 million for Phase 1(b). The low bid was already \$6.9 million higher than the \$85 million in AID loan funds authorized for the project. As explained in detail in the PP Supplement, the revised estimated total construction cost for both Phase 1(a) and Phase 1(b) is now \$105 million, including contingencies. The increase is the result of under-estimation of construction costs and inflation in the original PP. A sum of \$2 million is in the PP Supplement for operation and maintenance equipment to manage the completed irrigation system, revised downward from \$3.6 million in the original PP.

A condition in the original project authorization, incorporated into the Project Loan Agreement, was that a review be made of overall progress in Phase 1(a), particularly the fulfillment of GSL commitments and responsibilities to the project, prior to commitment of project funds to Phase 1(b) construction. This review was conducted in June, 1983. It concluded that satisfactory implementation progress is being made with respect to Phase 1(a) on both GSL-financed and AID-financed work, that System B is receiving its due share of GSL resources and that there are reasonable prospects that the GSL will provide adequate funding to support Phase 1(b). Accordingly, it recommended that AID proceed with contract financing for Phase 1(b). However, in view of the requirement for increased funding to meet the revised construction costs, AA/ASIA directed that action to commit funds to the Z/D contract for Phase 1(b) be postponed until formal submission by USAID/Sri Lanka and AID/W approval of a PP Supplement justifying the increase in project costs. Guidance for proceeding with preparation of the PP Supplement is in State 245973, which was based on the USAID's outline of the proposed PP Supplement contained in Colombo 5083 (see Annex A).

The key deadline is December 31, 1983. This is the date by which GSL must exercise its early option under the Z/D contract to proceed with construction of Phase 1(b). Not to do so would result in substantial additional costs due to the relatively low contract price of the Phase 1(b) early option to which Z/D is already committed if the GSL exercises the option by December 31, 1983.

The June 1983 review also contained a series of recommendations to improve the project which have been incorporated as a \$3 million AID grant-financed technical assistance package in the PP Supplement. The new grant element of the project is justified herein and will bring the total revised project cost to \$110 million.

Implications of the communal violence in Sri Lanka during July/August, 1983 upon project activities are judged to be minimal. The disturbances had very few direct impacts upon the project. There were no incidents in the project area although work slowed down considerably for two weeks due to the curfew and general unease. Problems at the port and in customs clearances delayed project imports for about a month. A few Zachry/Dillingham's local suppliers were burned out forcing Z/D to procure some items from Singapore. While the disturbances will have some impact on inflation in the construction sector, it should not be too great due to the overall recent slump in construction locally. There is also no indication that costs associated with GSL rehabilitation programs in response to the violence will affect GSL commitments to the project in terms of either current budget and administrative support or future downstream activities. The ultimate effect on the settlement schemes cannot be predicted with certainty but there is no present indication that any plans will be altered.

The MBD Phase II project is an integral part of the USAID's development strategy for Sri Lanka, as described in the approved CDSS, ABS and FY 1984 Congressional Presentation. The project is consistent with the goals of the Asia Bureau Strategy for the agricultural sector and the irrigation and water management subsector. Furthermore, the project is linked in several ways to AID's four cornerstone priorities of policy dialogue, institutional development, private sector involvement and technology transfer (see examples under Rationale).

Except as otherwise indicated in the PP Supplement, the project as described in the original PP remains unchanged. It is reconfirmed as being financially, economically, technically, administratively, socially and environmentally sound.

2.0 PROJECT RATIONALE AND DESCRIPTION

2.1 Rationale for Amending the Project

Sri Lanka's economic growth for the foreseeable future will depend upon the performance of the agricultural sector. In 1982, this sector accounted for 29 percent of Gross Domestic Product, 50 percent of employment and 60 percent of the country's export earnings.

The GSL's lead project in the agricultural sector is the Accelerated Mahaweli Program (AMP). This program continues to carry the highest priority in the GSL capital budget. Of budgeted capital expenditures of \$876 million in 1983, almost half (48%) is directed towards the agricultural sector, and the AMP alone has been allocated \$294 million (34%) equal to over 70% of agricultural investment. The bulk (90%) of the \$294 million supports construction of the major dams primarily for irrigation and hydroelectric power. System B is the

third largest recipient (out of 10 budgeted AMP projects), absorbing \$33 million (11%) of the AMP budget for 1983.

The GSL investment plan for 1983-87 estimates that the AMP will absorb 29% of the capital budget (60% of agricultural investment) over this five year period. As construction work on the AMP is completed, investment will decline from 34% in 1983 to 27% in 1987. During this period, except for the Kotmale Dam, the Left Bank of System B has the highest priority in terms of planned allocation of investment resources.

MPD Phase II at a revised total cost of \$251 million is a major component of the AMP. The water to be provided under this project is the key variable determining how much land can be settled and cultivated on the Left Bank of System B. All other development on the Left Bank of the Maduru Oya is dependent on the irrigation water to be conveyed through the main and branch canals constructed under this project. To ensure effective, efficient and timely cultivation of the land in the project area, all other components of the project (tertiary canals and drainage systems, on-farm development, road, administrative and social infrastructure, and the settlement of farm and non-farm families) must also be completed on schedule. Thereafter, to ensure effective and efficient operation of the completed system, the institutional capabilities of the implementing agency, the Mahaweli Authority of Sri Lanka (MASL), need to be strengthened to provide continuing support for settlement of the people, development of the land for cultivation, social services, agricultural services, and the management, operation and maintenance of the irrigation system.

The June 1983 review of MPD Phase II concluded that satisfactory implementation progress is being made in Phase 1(a) of the project on both GSL and AID-financed work, and that the Left Bank is receiving its due and adequate share of GSL budget resources. It further concluded that reasonable prospects exist that the GSL will provide adequate funding in its budget to support the completion of Phase 1(b) of the project. Accordingly, the review team recommended that AID proceed with actions to authorize additional funds to complete the construction of the main and branch canals in Phase 1(b).

The original construction costs were estimated to be \$81.4 million in mid-1980 whereas they are now estimated to be \$105.0 million, an increase of \$23.6 million. The remaining \$3.6 million of the original \$85 million loan was for life-of-project operation and maintenance equipment, which has now been reduced to \$2.0 million. The shortfall in construction funds is due mainly to inflation. Since 1979, Sri Lanka has experienced significant domestic inflation, so that 1982 and 1983 price levels are substantially above those prevailing in the base cost year of 1979. Key indicators of Sri Lankan price and wage levels show that April 1982 price levels were between 63 and 80 percent higher than mid-1979 levels. The impact of this inflation has been partly accommodated by the decline in the value of the rupee versus the U.S. dollar, i.e. the rate for converting rupees to dollars has gone up over the course of the project from 16 to 24.

The June 1983 review also pointed out several areas in which AID has a high interest, but which were not included in the original loan. These activities are: (a) the financial planning and monitoring of System B; (b) data collection and monitoring of settlement and agricultural activities; (c) economic and social support for settlers especially in the areas of agricultural production and the potential health hazards from malaria; (d) improved irrigation system management, operation and maintenance; (e) the economic use of water by farmers and policy on water use charges; and (f) manpower planning for

off-farm employment. To address these and other concerns, the PP Supplement includes the \$3.0 million technical assistance and training package described in more detail in the revised Technical Analysis.

MBD Phase II is a key part of USAID's agricultural development strategy for Sri Lanka and is its highest priority project as described in the latest Country Development Strategy Statement (CDSS) update, the FY 1984 Congressional Presentation (CP), and the FY 1985 Annual Budget Submission (ABS). The project directly supports AID's overall goals of: (a) increased food availability through increased agricultural production with emphasis on increasing and sustaining the productivity, incomes and market participation of small farmers; and (b) improved food consumption in rural and urban areas through expanded productive employment and incomes of men and women who at present lack the purchasing power to obtain adequate food. It also directly supports the Asia Bureau's Strategic Plan goal of increasing the output of basic foods to permit substantial improvement in the diets and incomes of poor people through irrigation and agricultural production.

Furthermore, the proposed technical assistance package will allow AID to address more directly its four "cornerstone" priorities as they relate to this project, in the following ways:

(a) Policy Dialogue: Improvements or changes will be sought in GSL policies in the areas of water management and user charges for irrigation water. This is complemented by on-going policy dialogue on these subjects under USAID's Water Management I project (383-0057) and centrally-funded activities in irrigation sector support.

(b) Institutional Development: Improvements will be made in the institutional capability of the MASL to plan, operate and maintain irrigation systems and to monitor settlement and agricultural production activities. The research and training capacities of other institutions will also be improved, including universities and the Agricultural Research and Training Institute of the Ministry of Agriculture.

(c) Private Sector Involvement: Assistance will be provided for manpower planning and strategies to promote business enterprises in the project area required to support the new population and the agricultural production activities of farm family settlers; and

(d) Technology Transfer: The project provides new techniques in canal design and construction, e.g. excavation, compaction, and concrete canal lining. The main and branch canal concrete lining is the first of its kind in Sri Lanka. Sri Lankans trained in up-to-date methods of data collection, analysis, operation, management and implementation providing a basis for continued access to state-of-the-art technical practises.

The justification for the additional \$25.0 million in AID loan and grant funds is summarized as follows:

(a) the need to meet AID's implied commitment to fully fund the construction cost of the main and branch canals of the Left Bank of the System B, which if not undertaken will undoubtedly be considered by the GSL as a backing away by the U.S. Government of its commitment to the AMP;

(b) the consideration that other donors involved in aspects of Phase 1(a) and 1(b) development have indicated informally that their involvement depends on continued AID participation in the project;

(c) GSL funding considerations, especially the need that would arise to divert funds from other project components (tertiary canals on-farm development, roads, social infrastructure, etc.) to complete the main and branch canals, thereby seriously delaying the completion of the project; and

(d) the need through the proposed grant package for AID to become directly involved in other areas which will enhance the success of the project and ensure that the beneficiaries and the country receive its full benefits.

2.2 Project Description

(a) Project Goal

The broad goal of the AMP to which this project contributes is to increase employment, food production, opportunities for equitable economic development and hydro-electric power capacity in Sri Lanka. When completed, the AMP will: (1) bring under irrigated cultivation 127,000 hectares (313,196 acres) of land increasing food production by 224,000 metric tons annually; (2) create employment for 45,500 people supporting a total of 250,250 people (average 5.5 per family) through construction work, farming activities on newly irrigated lands, non-farm activities and administrative positions; (3) increase the total hydro-electric power generating capacity by 466 MW, sufficient to meet Sri Lanka's power requirements into the 1990's; and (4) provide sufficient storage to irrigate an additional 121,000 hectares (302,700 acres) of land at a later stage. The goal of the AMP and of this project remains unchanged and valid.

(b) Project Purpose

The project purpose of MBD Phase II which remains unchanged is to develop the area of System B lying along the Left Bank of the Maduru Oya. The project area totals 75,000 hectares (184,752 acres) and currently has a population of about 20,000, (3600 families) most of whom produce one crop under small existing tank irrigation schemes. The existing small tank irrigation schemes will be provided supplemental water and the farmers will be trained in improved management practices. The area will be developed by providing an irrigation system and settling 20,300 voluntary farm families on 1.0 hectare farm allocations and 0.2 hectare homesteads with appropriate social and agricultural production infrastructure. About 21,830 hectares including 1,530 hectares of upland farms, (53,918 acres) of land will be brought under irrigation increasing food production by 106,340 metric tons annually. Employment for 28,100 workers and their families (154,550 people) will be created through construction work, farming on newly irrigated land, non-farm activities and administrative personnel for the project, and average annual income per family will increase from Rupees 4,500 to 11,000.

(c) Project Outputs

The original PP included six components: (1) construction of main and branch canals; (2) tertiary irrigation canals and drainage system; (3) main, secondary and farm roads; (4) on-farm development consisting of land clearing, farm demarcation, land levelling, land construction and initial plowing; (5) administrative and social infrastructure consisting of construction of hamlets, block centers and townships and construction and operation of administrative infrastructure; and (6) relocation and resettlement of farmer and non-farmer families including the provision of housing materials, farm tools, credit, and production, and marketing extension services. Changes in anticipated outputs of each component are given below. Status of physical completions is in the revised Implementation Plan and in Table 1, Annex J.

(1) Main and Branch Canals

This component now consists of the construction of 53 kilometers of main and 87 kilometers of branch canals required to serve Zones 1, 2, 3, 4 & 5 of the Left Bank irrigation system. The actual length and sizes of main and branch canals were modified during the design stage based on actual field layout and flow data requirements. The main canal was reduced from 57 kms to 53 kms and the branch canals were reduced from 98 kms to 87 kms. The size of the main and branch canals were simultaneously increased in cross-section to accommodate the increased flow requirements based on final design data.

(2) Tertiary Canal and Drainage Systems

This component now consists of 2,341 kilometers of distribution canals (533 Km), field channels (1,347 Km), and drains (461 Km) required to deliver irrigation water from the branch canal turnouts to individual settler farms in Zone 1 (6,056 hectares), Zone 2 (4,374 hectares), Zone 3 (3,259 hectares), Zone 4 (5,831 hectares) and Zone 5 (2,310 hectares). The actual length and sizes of the canals and drains are being modified based on actual field layout and flow data requirements. The tertiary canals lengths have changed from 640 km to 533 kms, the field canals remain unchanged at 1,347 kms, and the drains have changed from 490 kms to 461 kms. The sizes of the canals were also modified during design to accommodate actual flow requirements.

(3) Roads

This component consists of 733 kilometers of primary roads (90 km), access roads (150 km), link roads (142 km), and settlement roads and streets (300 km) within the hamlets, block centers and townships. The actual lengths and sizes of roads are being modified based on actual field layout and traffic requirements. To date only the link roads have changed from 139 kms to 142 kms.

(4) On-Farm Development

This component consists of clearing the farm land and forest and other cover, rough-leveling and deep-plowing the land and constructing the contour bunds in zones 1, 2, 3, 4 and 5. These processes ready the land to be irrigated for cultivation by the individual settler farmers. The hectares to be developed have not changed from the 20,311 hectares stated in the original PP.

(5) Administrative and Social Infrastructure

This component consists of the administrative infrastructure and services required to design, construct and operate the Left Bank irrigation system and the construction of social infrastructure required to support the settlers. It includes construction of required field offices, operation and maintenance shops and staff housing at all the field locations for the MASL. It also includes construction of settler-worker camps, social service buildings and facilities (schools, health facilities, postal facilities, telecommunication facilities, electrical service facilities, police facilities, etc.) and markets and bank buildings for use by the public and private sector.

Townships

There will be two (2) townships consisting of approximately 10,000 families (55,000 people) established in the project area. Townships will be provided with a senior secondary school, a health unit (36-bed hospital), a

post office, a police station, a market, a bank, MASL administrative complex, electric power services and telecommunication services.

Block Centers

There will be 15 block centers consisting of approximately 2,000 families (11,000 people) established in the project area. Block centers will be provided with a junior secondary school, a visiting dispensary, a sub-post office, a public health unit and stores for agricultural inputs and produce.

Hamlets

There will be 130 hamlets consisting of approximately 200 families (1,100 people) established in the project area. Hamlets will be provided with a primary school, a health volunteer office, a post box and a MASL unit service center.

The basic planning for these facilities and services has not changed from the original PP. However, detailed plans have been completed for most type facilities and better estimated costs have been established.

(6) Settlement Assistance

The settlement assistance component consists of a dynamic process which entails recruitment and physical transferrance of settlers and settler households and the adjustment of the resettled households to their new habitat. By the end of the project, 20,300 (111,650 people) families will be settled into the project area and the existing 20,000 population will be integrated into the project. To assist the settlers' adjustment, medical personnel, teachers, extension assistants and potable water are made available at the outset of the settlement period. In 1982, 1050 settlers were settled and in 1983, 2,000 will be settled.

(d) Project Inputs: The type and magnitude of all inputs have changed considerably since the project was designed. The original project inputs were major canal construction, other construction, settlement and settler support, equipment procurement and technical assistance. The following paragraphs describe the changes.

(1) Major Canal Construction

This input is to finance the construction work of the main and branch canals. The magnitude of the AID input has increased by \$23.6 million from \$81.4 to \$105.0 million. This increase is due to inflation. This input was to be financed (100%) by AID in the original PP. Under the PP Supplement's revised Financial Plan the GSL will provide \$1.07 million (1%) of construction costs.

(2) Other Construction

This input finances construction of tertiary and drainage canals, roads, on-farm development, and social and administrative infrastructure. The magnitude of the GSL input excluding inflation and contingencies has increased by \$42.1 million from \$41.5 to \$83.6 million. This increase is due to inflation.

(3) Settlement and Settler Support

This input finances all settlement activities including initial settlers selection, relocation in the project area, involvement in project work, development of farms, planning and staffing of social infrastructure, provision of production inputs, extension services, water user organizations, marketing of produce, and overall well-being of the settlers. The magnitude of the GSL input excluding inflation and contingencies has increased by \$2.0 million from \$7.3 to \$9.3 million. The increase is due to inflation.

(4) Equipment Procurement

This input is to finance the O&M equipment that will be required to operate and maintain the completed irrigation system. The magnitude of this AID input has decreased by \$1.6 million from \$3.6 to \$2.0 million. An additional \$697,000 in commodities (Annex F) is included in the new grant-funded technical assistance package bringing the revised total to \$2,697,000.

(5) Technical Assistance

Under the original PP some technical assistance was to be provided under the Mahaweli Basin Development Phase I project. This included supervision of construction services and other technical assistance as required. This PP Supplement will provide additional technical assistance with grant financing. The additional assistance consists of technical advisors in the areas of systems operation, system and equipment maintenance, water management, financial planning and monitoring, water user charges and agricultural production. This input will provide approximately 126 person months of service and training and research equipment at a cost of approximately \$1,638,000.

(6) Training

This is a new grant-financed input to the project. It will provide in-country, short-term and long-term participant training in Code 941 and the U.S. in the areas of water management, system management, operation and maintenance; financial planning, budgeting and monitoring, data collection and analysis for settlement and agricultural production, and agricultural research and production at a cost of \$430,000.

(7) Evaluation

This is also a new grant-financed input to the project. It will provide financing for data collection on settlers and agricultural production, monitoring the activities of the settlers and annual and final project evaluations at a cost of \$235,000.

3.0 COST ESTIMATE AND FINANCIAL PLAN

3.1 General

Revised costing of the six components is included in Table I. The dollar costs have been converted from rupee costs using the average yearly rupee/dollar exchange rate for the years 1979 through 1983 and the rate of Rs.24 to one dollar U.S. for 1984 through 1988. All local costs are the most recent GSL estimates as of September 1983 with escalation at 10% for foreign exchange costs and 15% local costs.

TABLE I
COSTING OF PROJECT OUTPUTS/INPUTS

(\$000)

<u>OUTPUTS</u>	<u>AID</u>		<u>INPUTS</u>		<u>TOTAL</u>
	<u>LOAN</u>	<u>GRANT</u>	<u>GSL</u>	<u>OTHER DONOR</u>	
1. Main and Branch Canals	106,000	1/ -	1,070		107,070
2. Tertiary and Drainage System	1,000	1/	30,589	* 2/	31,589
3. Roads (including ADB)	-	-	22,360	5,000	27,360
4. On-farm Development	-	-	16,112	* 2/	16,112
5. Social and Administrative Infrastructure	-	-	51,293	2/	51,293
6. Settlement Assistance	-	-	14,575	* 2/	14,575
7. Technical Assistance Package 3/	-	3,000	-	-	3,000
TOTAL	107,000	3,000	135,999	5,000	250,999

1/ \$2,000 for O&M equipment divided \$1,000 each between outputs 1 and 2.

2/ Pending other donor funding of downstream works includes CPEC (\$9 million unallocated), ADAB (\$15 million unallocated), EEC (amount pending), the Saudi Fund (amount pending), and USAID reimbursements for downstream works under the Mahaweli Sector Support project (383-0078). This will reduce GSL costs accordingly but GSL will bear at least 25% of total cost.

3/ Technical Assistance package will support all six components. The \$3 million has not been allocated to individual components.

The original PP cost estimates for Phase 1 main and branch canals and O&M management was \$85.0 million: \$42.3 million for Phase 1(a) and \$39.1 million for Phase 1(b) and \$3.6 million for O&M management. The estimated cost of all other components was estimated in the PP at \$122 million. These estimates were prepared by ACRES International in 1979 for the System B feasibility report and reviewed by CH2M Hill Inc. prior to inclusion in the PP. The GSL has revised the rupee cost estimate of all works, except the main and branch canals, from 1,955.1 million rupees to 3,033.1 million rupees (\$131.9 million at exchange rate of 23:1), or a 55 percent increase.

Table II gives a summary of increased project costs. As shown in the table the increase in AID project funds does not represent a decrease in the GSL contribution. In fact, despite the marked reduction in the rupee/dollar exchange rate, the GSL contribution will increase. The current GSL contribution is 45% of overall project costs, with a USAID contribution of 43% and ADAB, ADB

and OPEC contributions of 12%. Table 2, Annex J presents a breakdown of projected annual expenditures through the life of the project.

TABLE II
CHANGES IN PROJECT BUDGET

(\$000)

I. AID GRANT

A. Technical Assistance Package

	<u>PP</u>	<u>PP Supplement</u>	<u>% Change</u>
1. Training (Long & Short Term)	-	430	New
2. Technical Assistance (Research, O&M, Management Planning, training)	-	1,638	New
3. Commodities	-	697	New
4. Evaluation	-	235	New
TOTAL GRANT	-	3,000	New

II. AID LOAN

1. Construction	56,000	91,900 ^{1/}	+64%
2. Commodities	3,600	2,000	-56%
3. Contingency/Escalation	<u>25,300^{2/}</u>	<u>13,100^{3/}</u>	-52%
TOTAL LOAN	<u>85,000</u>	<u>107,000</u>	+26%

1/ Based on contract award price

2/ Based on 10% FX and 15% IC escalation

3/ Based on 5% escalation and 9% contingency

III. GSL CONTRIBUTION*

1. Main and Branch Canals	-	1,070	New
2. Tertiary & Drainage System	28,200	30,589	+ 8%
3. Roads (including ADB)	24,000	27,360	+11%
4. On-farm Development	14,800	16,112	+ 9%
5. Social and Administrative Infrastructure	39,100	51,293	+31%
6. Settlement Assistance	12,500	14,575	+17%
TOTAL	<u>118,600</u>	<u>140,999</u>	+19%
IV. TOTAL PROJECT	<u>203,600</u>	<u>250,999</u>	+23%

*Includes \$24 million in unallocated contribution from OPEC and ADAB. Escalation and contingency incorporated in above figures.

3.2 SHORTFALL OF FUNDING

Table II shows that the cost for the main and branch canals, based on the final construction contract awarded to Zachry/Dillingham, is about 26% greater than the PP cost estimate and the total project cost is about 23% greater. At the time of bidding, inflation on construction cost items was high throughout the world and especially in Sri Lanka. As a result the actual bids received for main and branch canal construction ranged from \$91.9 million to \$120.0 million, with the engineer's estimate (B/I) greater than any of the bids at \$136.4 million.

It is reasonable to assume from the bids received that the 26% increase in construction cost is due to underestimation of costs in the PP stemming entirely from inflation. In 1983, AID agreed to fully fund the estimated total cost of Phase 1(a) of the Z/D contract which amounted to a bid price plus estimated escalation cost for a total of \$68 million. The total Phase 1 price assuming for the early option for Phase 1(b) is exercised amounts to a bid price of \$91.9 million plus an estimated contingency/escalation cost of \$12.1 million for a total of \$105 million.

3.3 EFFECTS IF ADDITIONAL FUNDS ARE NOT PROVIDED

The additional funds will fulfill AID's implied commitment to fully finance canal construction while GSL and other donors will finance downstream works. If additional funds are not provided, the project will not be completed as currently designed and as recommended by the June 1983 review team. If the AID funding for Phase 1(b) is not forthcoming, the GSL will have to finance that construction from their own or other donor resources. The Phase 1(b) part of the contract is financially a bargain and the GSL will undoubtedly pick-up the Z/D Phase 1(b) option. Some of the GSL resources presently planned to be used to complete Phase 1(a) could possibly be diverted to Phase 1(b) to assure Z/D completing the main and branch canals in Phase 1(b) under the present contract.

This alternative would deprive the GSL of available resources earmarked for downstream development and might well result in a delay in the development of agricultural and social infrastructure and the pace of settlement. Other potential Phase 1(b) donors could possibly decide not to participate in the downstream works of Phase 1(b) as these possible donors have indicated informally that their involvement depends on continued USAID involvement in Phase 1(b). The net effect on the project would be completion of the main and branch canals in Phase 1 with a delay in providing the distributaries, drains, roads, land preparation, settlement schemes, and related and social infrastructure.

4.0 IMPLEMENTATION PLAN

4.1 Project Status

The following is a summary of project progress as of June 30, 1983, or August 31, 1983 where information is available. Data is drawn from the report of the June 1983 review team, USAID site visits and GSL reports.

a. Main and Branch Canals:

Construction of the Phase 1(a) main and branch canals is about 24% complete as of August 31, 1983 with 56% of the contract time expended. The contractor is presently revising his construction activities and preparing a CPM schedule to expedite completion of the canal work. Completion of Phase 1(a) canals will allow cultivation of irrigated paddy in the 1984/1985 Maha season (November-March). On September 9, 1983, the contractor was to have completed the first portion of Phase 1(a) designated the "LB-R1 Section of Works" comprising the cut and cover concrete conduit (800 meters with inlet and outlet transitions), the first 1.2 km of lined main canal, the gated inlet of the Kuda Oya Siphon, the 65 cumec syphonic spillway, and about 12.8 km of lined branch canal R1 (first right branch canal) inclusive of all appurtenant structures.

<u>Item</u>	<u>August 1983</u> <u>Percent Complete</u>
1. Cut and Cover Section	55%
2. Main Canal	35%
3. Kuda Oya Inlet	15%
4. Syphonic Spillway	20%
5. LR-R1 branch canal	55%

b. Tertiary irrigation system, roads, social infrastructure, land clearing and levelling, settlement, and farm demarcation:

The MEA and MDB have completed almost all of the above items in the first settlement area (zone 5) and are beginning work in the second settlement area (zone 1). Zone 5 activities will be 90% complete by Maha 1983/1984 and Zone 1 will be complete by Maha 1984/85. Table 1, Annex J presents the percent complete of physical infrastructure in Zone 5 and Zone 1.

The technical assistance package added by this PP Supplement will complement and add to the O&M and water management program being initiated under the Mahaweli Basin Development Phase I project. An operation and maintenance (O&M) specialist is currently in Sri Lanka under the Phase I project. A draft O&M manual for Zones 5 and 1 has been submitted to the MASL for review. The final O&M manual will not be prepared until after a hands-on training period using the manual is complete. Included with the activity is setting up a project water management cadre as well as an operation and maintenance cadre. At the present time it is expected that the O&M specialist will be active in developing and training the Water Management and O&M cadre, through June 1984. The training of the cadres will be in the Zone 5 area of Phase 1(a) as that area will receive water during December 1983. The technical assistance and commodity procurement financed under MBD Phase II is planned to dovetail with the on-going activities.

4.2. Implementation Plan

The implementation plan, as stated in the PP, consisted of five components: major canal construction, other construction, settlement and settlement support, equipment procurement, and technical assistance. This categorization remains the same except for the addition of the technical assistance activities and changing the nomenclature of the components to fit the MASL accounting terminology. As outlined, the major canal construction is being done by a U.S. contractor; other construction is being done by local contractors under the supervision of MDB; settlement and settlement support is being done by the MEA; equipment procurement is being handled MASL; and construction related technical assistance is being provided by Berger/IECO under a host country contract financed under MBD Phase I.

The revised implementation schedule is as follow:

a. Completed Activities

<u>Date</u>	<u>Action</u>	<u>Responsible Agencies</u>
5/81	Project Loan Agreement signed Initial Conditions Precedent met	GSL/USAID
1/82	IFB Approval	GSL/USAID
3/82	Amendment 1 to Project Agreement	GSL/USAID

	signed	
5/82	Contract signed by GSL	GSL/ZD
6/82	Contract Award/Approval	GSL/USAID
6/82	Contractor begins Mobilization	Z/D
9/82	Amendment 2 to Project Agreement signed	GSL/USAID
3/83	Amendment 3 to Project Agreement signed	GSL/USAID
6/83	Project Review by AID/W and Mission staff	USAID

b. Future Actions

10/83	PP Supplement to AID/W	USAID
11/83	Administrator Approval	AID/W
12/83	Amendment 4 to Project Agreement signed	GSL/USAID
12/83	Phase 1(b) Construction Early Option exercised	GSL/Z-D
7/84	Construction Phase 1(a) completed	Z-D/GSL
3/86	Construction Phase 1(b) completed	Z-D/GSL
9/86	PACD	GSL/USAID

5.0 MONITORING AND EVALUATION

1. USAID monitoring of the total project falls under the USAID Office of Mahaweli and Water Resources Development which has adequate staff to monitor the project. This Office includes three U.S. direct hire engineers and two FSN engineers. A USAID engineer visits the project site at least monthly to inspect construction progress and monitor other project elements. In addition the Project Officer monitors other project elements such as training, equipment, procurement, technical assistance, O&M cadres, settlement and social/agriculture infrastructure.

As stated in the PP, monitoring is a continuing activity of the GSL. Baseline data is provided in the ACRES feasibility report, the TAMS Environmental Assessment, Dr. Thayer Scudder's settlement studies, and a baseline data study conducted in 1981 covering existing agricultural patterns, existing institutional support and infrastructure facilities, characteristics and occupational patterns of the labor force, and non-agricultural services. A special monitoring effort to be undertaken in Zone 5 utilizing grant funds is described in the Technical Analysis.

Annual evaluations of the project are conducted by the GSL project coordinating committee augmented as necessary by home office representatives of AID, CIDA and ADAB. Special evaluations are conducted on particular topics or subjects as required. USAID will also conduct an overall evaluation of the project in FY 1986.

6.0 PROJECT ANALYSES

6.1 Technical Analysis

As indicated above there are no major quantitative changes in any of the six project components. However, greater effort is demanded to insure that the systems installed are properly utilized and that the farm families who settle in the area reap the project's intended benefits.

The principal concerns stem from experience and lessons learned in similar projects in Sri Lanka such as System H and Gal Oya. These include:

- o Main and Branch Canals - Provision of concrete lining to reduce canal leakage and prevent waterlogging and salinity;
- o Tertiary Canals and Drains - Proper curing of concrete, proper invert gradients, proper compaction and farmer-assisted sizing and layout of the tertiary system;
- o Roads - Correlation of road, irrigation system and settlement layout in the field and in the office;
- o On-farm Development and Land Clearing - involvement of farmers in allocation and layout of their farms, location of homesteads and irrigation water delivery within twelve months of the farmers' arrival at project site;
- o Settlement Assistance - Agricultural planning and provision of services at outset of project to assure credit, marketing and extension assistance, information to farmers to limit paddy in unsuitable areas and diversify agricultural crops, and to recommend optimum crop production through research; and
- o Social and Administration Infrastructure - Decentralization of staff responsibilities for construction, operation, maintenance and water management; establishment of farmer organizations (water user associations) and relationships between farmers and MASL staff; and provision of housing, credit, production, marketing, medical and school facilities.

Though much data has been accumulated on these questions and is already being applied to some extent in System B, it is recommended that an expanded technical assistance package be incorporated into the project to build on earlier experience and assist the MASL in a variety of functions. The most universal need and the largest component of the proposed TA package is in-country training for MASL personnel in (1) operations and maintenance of the total irrigation system including drainage systems from the main and branch canals through the tertiary canals to field channels and farm plots; (2) irrigation system equipment use, maintenance and repair; (3) water management including data collection, scheduling, and water charges; (4) maintenance and repair of project roads; and (5) with assistance of the research effort, maximizing of on-farm development and crop diversification. In-country technical advisors can provide training in these subjects to key field staff and farmer representatives and assist in the institutionalizing of an on-going training program. The project's experimental farm can be provided with a long-term advisor to assist agriculture extension workers and other field staff and farmers. Long and short-term overseas training in the U.S. or other authorized countries is also recommended at universities or institutions having strong water management programs.

Specific areas of emphasis in the TA package are discussed below:

System Operation and Maintenance

Irrigation projects throughout Sri Lanka show the effect of limited O&M, e.g. silting and eroding water channels, destruction of structures, inadequate and untimely water deliveries. At present MASL does not have a definite organization for O&M. The need for such an organization is recognized by MASL and an organization is being set up in MASL. The MASL budget for 1984 does not have a line item for O&M costs but some costs are included in the 1984 construction budget.

The setting up of the organization and the preparation of an O&M manual is currently being assisted by the B/I O&M specialist with active participation of the MASL personnel (funded under MBD Phase I). This assistance addresses the key issue of water delivery reliability and is directed toward implementing operational and maintenance procedures to provide adequate water in a timely fashion. The additional technical assistance in the PP Supplement will build upon the initial efforts of the B/I specialist by training sufficient O&M personnel to assure day-to-day irrigation operations and an effective maintenance program for the entire system.

Water Management and Water Charges

The TA will concentrate on developing strong water management organizations, both at the farmer (water user) level and on a system-wide basis. Emphasis will be placed on coordination of water deliveries to farmers based on reliable knowledge of rainfall, crop status, field water conditions, theoretical water requirements, and production capability. Routine monitoring will be done of actual water use in each zone. System-level data on monthly and seasonal basis will be fed back to the central coordinating organization in Colombo to identify and help resolve potential conflicts between irrigation and hydroelectric power generation requirements.

It is the plan of MASL, when an adequate, timely water supply is provided to farmers in the project area, to assess users with a water charge. A financial analysis of the water users' ability to comply with water charges has not been done, nor have the users been told that a payment will be requested. At present, MASL is talking about approximately Rs.200 per acre per year with the charges beginning at about Rs.100 per acre per year the first year and the full Rs.200 after 5 years.

The TA will provide the means to train and involve the farmers as to the need of the water charges and the benefits to be derived from proper O&M management and participation. Particular attention will be paid to determine a rational level of water charges, collection, budgeting for their use, implementing their uses through farmer organizations and improving the MASL capability in the general area of water policy.

Data Collection and Monitoring

As stated in the June 1983 review, accurate data collection and reporting is needed in all facets of the project including research and off-farm employment. Current data collection in the project area is very limited. Some crop cutting is done by the Ministry of Agriculture at selected farm plots to estimate yields and flow measurement of the Maduru Oya is sporadically taken at Welikanda by the Irrigation Department.

In July 1983 the MEA participated in a Diagnostic Analysis Workshop sponsored by AID's centrally-funded Water Management Synthesis project. Twenty-five MEA employees attended a month-long training course at Maha-Illupullama in System H. The objectives of the course were to provide the skills required to monitor and evaluate irrigation projects and to identify positive and negative aspects of system operations through an interdisciplinary team approach. Participants from various disciplines (irrigation engineering, on-farm engineering, sociology, economics, agronomy and women in development) worked in teams to understand the complexities of the irrigation system overall and the farmer's role in managing his inputs. The course attempts to expand the participants knowledge in their own discipline to improve field study and data analysis skills and to broaden the individual's outlook. Six employees have also been sent to Colorado State University to work with CSU personnel in analyzing the data collected during the workshop and to prepare a report on the workshop's findings.

This type of TA will become available directly with project funds under the PP Supplement. The TA will provide the knowledge, training and equipment necessary to establish a data collection system, develop analytical capacities, and establish reporting mechanisms in monitoring water deliveries, temperature and rainfall, crops, operation and maintenance, water charges, financial accounting, and budget preparation. Non-farm employment data is also needed to enable MASL to adjust planning estimates which are now based on one non-farm family settled for every five farm families. It is proposed that systematic data collection and monitoring begin on a pilot basis in Zone 5 for adoption later in the other zones.

Training

In general, the training funded by the PP Supplement will build upon the multidisciplinary approach introduced to other areas of Sri Lanka under the Water Management Synthesis project, with a mix of disciplines in irrigation engineering, on-farm engineering, agronomy, economics and sociology. The proposed package consists of in-country and training, commodities; and long-and-short-term training overseas.

a. In-country Program

Training will be provided in-country by U.S. and local advisors in the disciplines of financial planning and budgeting, general management, water management including operation and maintenance, farmer organization and participation, water use charges, agriculture extension and research for rice and subsidiary crops, socio-economic research, equipment maintenance and repair, data collection and analysis, and monitoring and evaluation. The training will be provided through 126 person months of technical assistance at an approximate cost of \$1,638,000 (see Annex G). About 100 GSL staff will be trained and about 500 farmer representatives will be involved directly with the remaining farmers benefiting through the farmer representatives and water user associations.

b. Overseas Training:

Six participants will receive long-term training (MA/MS) in the U.S. or third countries. They are identified as a financial manager, two water management engineers, an agricultural lecturer, an agricultural researcher, and a socio-economist. Short-term training will be provided to 24 participants in numerous disciplines. Upon completion of the training, it is planned that all participants will serve as advisors in the System B area. The estimated cost of

overseas training is \$330,000 and training under the in-country program is \$100,000.

The remaining \$235,000 in the \$3 million grant includes \$100,000 for formal evaluations and \$135,000 for data collection efforts required for on-going monitoring activities.

6.2 Economic Analysis

When considering the impact of inflation in economic analysis the standard assumption is that all costs and benefits inflate at the same rate and thus have no net impact on the project. The purpose of this analysis is to show that this has been the case for the subject project.

The original economic analysis for System B was prepared by Acres International Limited in 1979. This analysis was reviewed by CH2M Hill and AID economists and the ACRES analysis was presented in the original PP. The original analysis showed an IRR of 10.1 percent, with a range from 8.4 percent to 11.6 percent depending upon assumptions. In April 1982, CIDA asked ACRES to provide an updated economic analysis for System B. That update provides the basis for this analysis.

Since 1979, Sri Lanka has experienced significant domestic inflation, so that 1982 and 1983 price levels are substantially above those prevailing in the base year of 1979. Key indicators of Sri Lankan price and wage levels are summarized in Table IV and show that April 1982 price levels were between 63 percent and 80 percent higher than mid-1979 levels. The impact of this inflation has been partly accommodated by the decline in the value of the rupee versus the U.S. Dollar, i.e., the rate for converting dollars to rupees has gone up over the course of the project from 16 to 24 rupees per dollar.

TABLE IV

SRI LANKA INFLATION INDICES

INDICATOR	MID	APRIL	PERCENT	APRIL	PERCENT
	<u>1979</u>	<u>1982</u>	<u>INCREASE</u>	<u>1983</u>	<u>INCREASE</u>
			<u>1979-82</u>		<u>1979-83</u>
BUILDING COST INDEX	100.0	178.2	78	194.8	95
COLOMBO COST OF LIVING INDEX	253.0	412.6	63	460.0	81
WHOLESALE PRICE INDEX	156.5	281.9	80	334.6	114

The ACRES update shows that changes in costs since 1979 have been more than offset by increases in economic benefits from paddy production. The benefits from irrigated paddy production account for more than 80 percent of total benefits at project maturity. In the April 1982 update, ACRES reevaluated the paddy production benefits using the same methodology applied in the original report. Making appropriate assumptions about future world prices for rice and agricultural inputs such as fertilizer (using World Bank projections), ACRES has estimated that 1982 paddy benefits are 82 percent greater than 1979 benefits (See Table 3, Annex J). As the analysis shows, through mid-1982 the rise in benefits equals or exceeds the rise in costs. A recalculation of the project IRR using 1982 cost and benefit levels should, therefore, yield answers in the same range or greater than in the original analysis.

It should also be noted that the original PP detailed but did not quantify many indirect benefits. These benefits will come through three types of multiplier effects (1) backward production linkages which will increase demand for inputs into the production process; (2) forward production linkages such as increased marketing and milling activity; and (3) increased demand for consumption goods.

The original project paper estimated that a one-unit increase in rural household income from increased paddy production will result in 2.91 units of increased income for the economy as a whole. It is estimated that the total indirect income generated will be rupees 1,247 million with total additional indirect employment generation of 30,800 person years. The June 1983 review team estimated that indirect employment generation could be as high as one non-farmer family for each farm family settled in the Mahaweli. ACRES, in its 1982 update, estimated that these indirect benefits would add at least 4 to 6 percentage points to the IRR. The above analysis reconfirms the continued viability of the Mahaweli initiative.

6.3 Social Soundness Analysis

The project remains socially and culturally feasible. The social soundness analysis included in the PP essentially remains a valid description of the expected beneficiaries and how they will benefit from the project. Furthermore, changes or additions included in the PP Supplement will result in benefits being available earlier to the beneficiary group. A change that occurred early in the project is the use of the settlers as casual labor for construction rather than worker/settlers. The worker/settler approach, though feasible, required too much supervision by the MEA. All tertiary canal construction work currently is being performed by small-scale contractor's utilizing casual labor under the supervision of MDB.

6.4 Administrative Analysis

As stated in the PP, implementation of the project is shared between the Ministry of Mahaweli Development and the Mahaweli Authority of Sri Lanka (MASL) which with various organizations under their control actually administer the project. The key MASL organizations involved in project implementation are the Mahaweli Economic Agency (MEA) which as a branch of the MASL is responsible for settlement and operation of social infrastructure, credit, production and marketing including extension and research program, and the Mahaweli Development Board (MDB) which is responsible for construction of irrigation systems and the area's social and administrative infrastructure. At the present time, the GSL is abolishing the statutory agency MDB created in 1976 and replacing it as a branch of MASL renamed the Mahaweli Engineering and Construction Agency (MECA). The MECA organization will retain all of MDB's responsibilities in construction and engineering but will not have MDB's statutory powers. The administration and responsibilities for the project will then be clearly defined as MASL's.

The administration has been followed as outlined in the PP. With MDB becoming a branch agency of MASL, the effectiveness of project administration should be improved. Current thinking in MASL is that the Maduru Oya headworks will be operated and maintained by MECA (MDB) and the canal system to the farm level will be operated and maintained by MEA. MEA is analyzing manpower requirements necessary to become a full-fledged O&M agency. If the final analysis shows too many areas where MEA is lacking in capability, the MASL and the Ministry may reconsider and have MECA operate and maintain the main and branch canals.

6.5 Environmental Analysis

The environmental concerns and recommended actions as expressed in the PP continue to carry a high priority with the GSL. The AID-funded Environmental Assessment conducted by TAMS resulted in a commitment by the GSL to mitigate the negative environmental impacts inherent in a program as massive as the AMP. Subsequent support given by the GSL, other donors and particularly AID under its Mahaweli Environment project (383-0075) are contributing to the ecologically sound and environmentally sustainable development of the AMP area and led the Asia Bureau in AID/W to state that "Sri Lanka will continue to be a showpiece in our efforts to develop sound environmental policies and programs" (ASIA Strategic Plan, page 64).

7.0 NEGOTIATING STATUS AND CONDITIONS

The following are Conditions Precedent that USAID and the GSL have tentatively approved.

1. Prior to the first disbursement of Loan or Grant funds under the PP Supplement, or to the issuance by A.I.D., of documentation pursuant to which disbursement of such funds will be made, the Cooperating Country will, except as the Parties may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D., an opinion of counsel acceptable to A.I.D. that the relevant Project Agreement Amendment/s have been duly authorized and/or ratified by, and executed on behalf of, the Cooperating Country, and that it and the Agreement as thereby amended constitute valid and legally binding obligations of the Cooperating Country in accordance with all of their terms. If the condition specified in this Section has not been met within ninety (90) days from the date of the relevant Amendment/s or such later date as A.I.D. may agree to in writing, A.I.D., at its option, may terminate this Agreement, as amended, by written notice to the Cooperating Country. A.I.D. will promptly notify the Cooperating Country when it has determined that the condition precedent specified in this Section has been met.

2. Prior to the first disbursement of Grant funds under this Supplement the GSL must establish the organization for operating and maintaining the Left Bank of Maduru Oya Irrigation system for System B and to demonstrate that it has provided adequate budget for its operation in FY 1984 and thereafter.

3. Prior to the first disbursement for Technical Assistance under the Grant the GSL shall provide a detailed requirement of the technical assistance required and how it will be used.

4. Prior to the first disbursement for Training assistance under the Grant the GSL shall provide a detailed training plan for in-country, short-term and long-term.

To retain flexibility in negotiating the Project Agreement Amendment(s), the above conditions are not included in the Draft Project Authorization Amendment.

ANNEX A

TELETYPE

AMERICAN EMBASSY COLOMBO

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FM ECSTATE WASHDC
TO AMEMBASSY COLOMBO 8675
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UNCLAS SECTION 01 OF 02 STATE 2973

AJDAG

E. 2 12356: N/A

TAGS:

SUBJECT MAHAWELI BASIN DEVELOPMENT II PROJECT
(303-0073) - PROJECT AMENDMENT

REF: COLOMBO 5023

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TOTAL

8

1. SUMMARY: PROJECT COMMITTEE (PC) REVIEWED THE PID-LIVE CABLE FOR THE SUBJECT AMENDMENT ON AUGUST 12, 1983 AND RECOMMENDED APPROVAL BY AA/ASTA. APAC WAS CONSIDERED UNNECESSARY. MISSION IS COMMENDED FOR COMPREHENSIVE CABLE. MISSION IS AUTHORIZED TO PROCEED WITH PREPARATION OF THE PP SUPPLEMENT, FOLLOWING THE GUIDANCE PROVIDED BELOW. END SUMMARY.
2. PP SUPPLEMENT SHOULD EXPAND ON FINANCIAL PLAN INCLUDED IN RETEL, OUTLINING CLEARLY THE DIFFERENT USES FOR THE ADDITIONAL FUNDING. SUPPLEMENT SHOULD IDENTIFY THE PORTION OF THE REQUESTED AMOUNT INTENDED FOR "NEW" NEEDS AND WHY, AND WHAT PORTION IS INTENDED TO COVER UNDERFUNDING. A FINANCIAL BREAKDOWN SHOULD SHOW THAT CONSTRUCTION CONTRACT WAS UNDERFUNDED AT THE OUTSET, AND THAT BUILT-IN INFLATIONARY ALLOWANCES ACCOUNT FOR MOST OF THE REQUESTED FUNDS. SUCH FINANCIAL ANALYSIS SHOULD BE STRUCTURED TO AVOID HAVING THE SUPPLEMENTARY FUNDING INTERPRETED AS INTENDED TO COVER "COST OVER-RUNS."
3. IMPLICATIONS OF RECENT UNREST FOR PROJECT: SUPPLEMENT SHOULD ADDRESS IMPLICATIONS OF THE RECENT UNREST FOR PROJECT. GSL COMMITMENT TO THE PROJECT IN TERMS OF ITS ABILITY TO PROVIDE BUDGET AND ADMINISTRATIVE SUPPORT IS OF PRIMARY CONCERN SINCE WE WOULD EXPECT THAT ATTENDING TO REHABILITATION WILL BE A HIGH PRIORITY TO THE GSL, AT LEAST FOR THE SHORT TERM. SIMILARLY, THIS PREOCCUPATION WITH EFFECTS OF RECENT STRIFE MAY DRAW GSL AWAY FROM COMMITMENT GIVEN DOWNSTREAM ACTIVITIES UP TO NOW. SUPPLEMENT SHOULD ALSO DISCUSS SOCIO-ECONOMIC IMPLICATIONS, SUCH AS EFFECT ON SETTLEMENT SCHEMES, POSSIBLE UPWARD INFLATIONARY TREND, ETC.
4. TECHNICAL ASSISTANCE PACKAGE: PC AGREES THAT A TECHNICAL ASSISTANCE (TA) ELEMENT WOULD BE A VALUABLE ADDITION TO THE PROJECT. SUCH TA EFFORT SHOULD BE DESIGNED TO ENHANCE BETTER UTILIZATION AND SUSTENANCE OF LARGE INVESTMENT IN INFRASTRUCTURE. TO THAT END, MISSION SHOULD EXPAND TA EFFORT TO INCLUDE FOLLOWING ELEMENTS:

(A) SYSTEM OPERATION: OPERATING THE IRRIGATION NETWORK IN SYSTEM B. ON A DAY-TO-DAY BASIS, POSES A GREAT

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CHALLENGE. MAXIMIZING AGRICULTURAL PRODUCTION DEPENDS PRIMARILY ON RELIABILITY OF WATER DELIVERY SYSTEM. OTHER FACTORS, SUCH AS WILLINGNESS OF FARMERS TO FORM USER ASSOCIATIONS, THEIR WILLINGNESS TO PAY IRRIGATION FEES, AND THEIR PERCEPTION OF THE DISTRIBUTIONAL EQUITY OF SYSTEM DEPEND PRIMARILY ON ADEQUACY AND RELIABILITY OF WATER DELIVERIES. TA SHOULD BE DIRECTED TOWARD DEVELOPING, TESTING, MODIFYING AND IMPLEMENTING OPERATIONAL PROCEDURES TO INSURE TIMELY DELIVERY OF ADEQUATE AMOUNTS OF WATER.

(B)- SYSTEM MAINTENANCE: IT IS IMPERATIVE THAT AN EFFECTIVE MAINTENANCE PROGRAM BE ADOPTED AT THE OUTSET. SUCH PROGRAM SHOULD INCLUDE BOTH PREVENTIVE AND CORRECTIVE MAINTENANCE ELEMENTS. IN ORDER TO HAVE A MAINTENANCE PROGRAM MANAGED AND OPERATIONAL BY THE TIME THE U.S. CONTRACTOR COMPLETES ITS WORK, WORK SHOULD BEGIN IMMEDIATELY ON PUTTING TOGETHER MAINTENANCE CADRES,

EQUIPPING THEM, PROVIDING FACILITIES FOR THEM, TRAINING THEM AND BUDGETTING FOR THEIR FUTURE NEEDS.

(C) WATER CHARGES: WORLD BANK LITERATURE INDICATES THAT GSL NEEDS SUPPORT IN THE AREA OF DATA COLLECTION AND USE OF WATER CHARGES, PARTICULARLY IN DETERMINING A RATIONAL LEVEL OF WATER CHARGES, COLLECTING THEM, BUDGETING FOR THEIR USE, AND IMPLEMENTING THEIR USES THROUGH FARMER ORGANIZATIONS. TA MAY BE DIRECTED TOWARD IMPROVING THE GSL CAPABILITY IN THIS GENERAL AREA.

5. TECHNICAL ASSISTANCE FUNDING: PC FELT THAT TA FUNDING LEVEL OF ONE MILLION DOLLARS MAY PROVE INADEQUATE FOR THE PROPOSED TA PACKAGE. THEREFORE PC RECOMMENDS THAT TA FUNDING LEVEL BE INCREASED TO THREE MILLION DOLLARS. THE OVERALL BUDGET FOR THE PP SUPPLEMENT SHOULD REMAIN THE SAME AT DOLLARS 25 MILLION, WITH THE INCREASE IN THE TA LEVEL COMING FROM THE CONTINGENCY ALLOWANCE, REDUCING CONTINGENCIES TO DOLLARS 7.0 MILLION. GRANT FUNDS WILL BE PROVIDED TO COVER THE 3.0 MILLION DOLLAR TA BUDGET.

6. INCORPORATION OF EXPERIENCE IN DESIGN: PP SUPPLEMENT SHOULD REFLECT LESSONS LEARNED AND EXPERIENCE GAINED IN THE DEVELOPMENT AND EARLY YEARS OF SYSTEM H AND THE REHABILITATION OF THE GAL OYA. IN PARTICULAR, SUPPLEMENT

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SHOULD TREAT ISSUES OF LOCATION OF TERTIARY WATER CONTROL STRUCTURES, USER PARTICIPATION IN DESIGN PROCESS OF TERTIARY CANAL SYSTEMS, WATER USER ASSOCIATIONS, AND DECENTRALIZATION OF AUTHORITY FROM COLOMBO TO FIELD STAFF AS WELL AS OTHER LESSONS.

7. MONITORING ZONE 5 OPERATIONS: PC RECOMMENDS THAT A MONITORING EFFORT BE UNDERTAKEN IN ZONE 5 OF SYSTEM B ONCE THE WATER BEGINS FLOWING. MONITORING OF WATER ALLOCATIONS, STRUCTURE BEHAVIOUR, OPERATIONAL PRACTICES EMPLOYED AND OVERALL SYSTEM PERFORMANCE MAY YIELD VALUABLE LESSONS THAT MAY HAVE APPLICATION IN OTHER ZONES OF -SYSTEM B. HOWEVER, SUCH AN EFFORT WOULD HAVE TO BE UNDERTAKEN ON A TIMELY BASIS, I.E. PROBABLY LATE OCTOBER OR EARLY NOVEMBER. -ARTI MAY BE A CANDIDATE ORGANIZA-

30 AUG 85 06 13z

TION THAT CAN DO THIS. ASSISTANCE WOULD PROBABLY BE AVAILABLE THROUGH THE WATER MANAGEMENT SYNTHESIS-OP E INITIATE WORK PRIOR TO AVAILABILITY OF II PROJECT TO INITIATE WORK PRIOR TO AVAILABILITY OF PROJECT FUND.

8. DATA COLLECTION: PP SUPPLEMENT SHOULD IDENTIFY WHAT EFFORTS ARE BEING MADE AND BY WHAT ORGANIZATIONS

TO COLLECT DATA ON PRODUCTION AND INCOME IN THE PADDY AREAS. PP SUPPLEMENT SHOULD ALSO INDICATE HOW RELIABLE THIS DATA IS AND WHAT IMPACT THE LEVELS OF PRODUCTION AND INCOME MAY HAVE ON NON-FARM, NON-PADDY AREAS.

9. LINKAGE TO AID PRIORITIES: PP SUPPLEMENT SHOULD IDENTIFY THE LINKAGE OF THE PROJECT TO THE-AID CORNERSTONE PRIORITIES (INSTITUTIONAL DEVELOPMENT, TECHNOLOGY TRANSFER, POLICY DIALOGUE AND PRIVATE SECTOR INVOLVEMENT). SINCE, ON THE FACE OF IT, THIS APPEARS A HIGH VISIBILITY, RESOURCE TRANSFER PROJECT, WE WOULD APPRECIATE YOUR DEMONSTRATING TIGHT LINKAGE TO THE FOUR CORNERSTONES. SHULTZ

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UNCLASSIFIED

Best Available Document

MAHAWELI BASIN DEVELOPMENT PHASE II
PROJECT NO. 383:0073
PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

ANNEX B
 Life of Project
 From FY 81 to FY 87
 Total U.S. Funding: \$110,000,000
 Date Revised: October 14, 1983

Project Title & Number: MAHAWELI BASIN DEVELOPMENT PHASE II (383-0073)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS										
<p>Program or Sector Goal: The broader objective to which this project contributes: Increase the opportunity for equitable economic development, employment, and food production through irrigation of land under the Accelerated Mahaweli Program and the voluntary settlement of people in the program area and increase hydropower capacity.</p>	<p>Measures of Goal Achievement: 53,000 hectares of net irrigable land cultivated. 69,000 people settled. Annual farm earning average Rs.16,000 per farm family hydropower is 1008 MW. (Goal by 1988 which will later be increased).</p>	<p>GSL Reports Consultant Reports Mission observations Annual evaluations Sociological surveys</p>	<p>Assumptions for achieving Targets: People will apply for land and financing for the total program will be available. Rainfall follows recent historical average.</p>										
<p>Project Purpose: Develop the area of System B of the AMP lying along the left bank of the Maduru Oya.</p>	<p>Conditions that will indicate purpose has been achieved: End of project status: 20,300 hectares of net irrigable paddy land cultivated 20,300 families cultivating the land 5,292 Non-farm families settled in the area. Average annual income of farm families is Rs.11,000. Functioning irrigation system Annual paddy production is 106,340 tons. Annual paddy production is 106,340 ton per/yr. Improve Operations, maintenance and management capability in the project area. Government policies and regulations enacted to ensure better water management, institution development and training.</p>	<p>As above and as detailed in the project paper's monitoring and</p>	<p>Assumptions for achieving purpose:GSL funds for System B development continues to be available.</p>										
<p>Output: Main, branch, tertiary irrigation system, roads, cleared and leveled land, social and production services and infrastructure.</p>	<table border="0"> <tr> <td>Main Canals</td> <td>53.0 km</td> </tr> <tr> <td>Branch Canals</td> <td>87.0 km</td> </tr> <tr> <td>Field Canals</td> <td>640.0 km</td> </tr> <tr> <td>Roads</td> <td>729 km</td> </tr> <tr> <td>Operating: Banks Secondary Schools Primary Schools Health Centers Post Offices Police Stations Settlers</td> <td></td> </tr> </table>	Main Canals	53.0 km	Branch Canals	87.0 km	Field Canals	640.0 km	Roads	729 km	Operating: Banks Secondary Schools Primary Schools Health Centers Post Offices Police Stations Settlers		<p>See above</p>	<p>Assumption for achieving outputs: Technical Ministries staff facilities provided under the project.</p>
Main Canals	53.0 km												
Branch Canals	87.0 km												
Field Canals	640.0 km												
Roads	729 km												
Operating: Banks Secondary Schools Primary Schools Health Centers Post Offices Police Stations Settlers													
<p>Inputs: Major irrigation system construction Technical Assistance</p>	<p>Implementation Target (Type and Quantity) \$107,000 million. 3.0 million.</p>	<p>See above</p>	<p>Beginning of Project Status No irrigation system serves the overall project area. Social infrastructure is minimal. The resident population 20,000. The average annual family income from agriculture is Rs.5300. The annual paddy production is 12,950 T/Yr.</p>										

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ANNEX C

STATUTORY CHECK LIST

The Statutory Checklist submitted with the original Project Paper has been reviewed in light of the changes introduced by this Project Paper Supplement. It is concluded that the original checklist remains a valid statement of how the overall project complies with statutory requirement, including 611(a) and 611(e) requirements. In addition, Sections 634A and 653(b) are updated as follows:

FAA Section 634A, Section 653(b)

Congress was notified about the changes to this project by the FY 1983 and FY 1984 Congressional Presentation. FY 1984 funding is included in the Operating Year Budget for FY 1984.

ANNEX E

Review of Progress
Mahaweli Basin Development - Phase II
Project No.383-0073
Dated: Colombo, Sri Lanka
July 1, 1983

Report on File in ASIA/PD

ANNEX F

COMMODITY PROCUREMENT

There has been no procurement to-date under the AID financed portion of the Mahaweli Basin Development Phase II. Under this supplement, procurement is planned to be done by the MASL.

The majority of commodities will be purchased from the U.S. except for shelf items readily available in Sri Lanka, such as classroom, office and workshop furniture; certain operation and maintenance equipment, spare parts, etc.

PROCUREMENT LIST

(\$000)

I. Grant (Technical Assistance) Related

O&M Equipment/spare parts	280
Training Equipment	180
Water Management Equipment	70
Office/Classroom Equipment	60
Laboratory Equipment	60
Consumable Materials	47
TOTAL	<u>697</u>

II. Loan (O&M Equipment)

Tractors, trailers, trucks, caterpillar tractors, vans etc. incl. 10% spare parts	1,500
Office and classroom equipment	50
Shop equipment including lathes, pumps, press hoists, tools etc.	150
Research/Laboratory Equipt.	150
Contingency	100
TOTAL	<u>2,000</u>

III. TOTAL COMMODITIES \$2,697

ANNEX G

DETAILED TA PACKAGE BUDGET (GRANT)

(AID FINANCED, \$000)

A. Technical Assistance

Advisors: 1/		
Operation & Maintenance	24 pm	
Equipment	18	
Planning	18	
Water Management	18	
Research	24	
Training	24	
	<u>126 pm</u>	<u>\$1,638</u>

B. Training (240 pm)

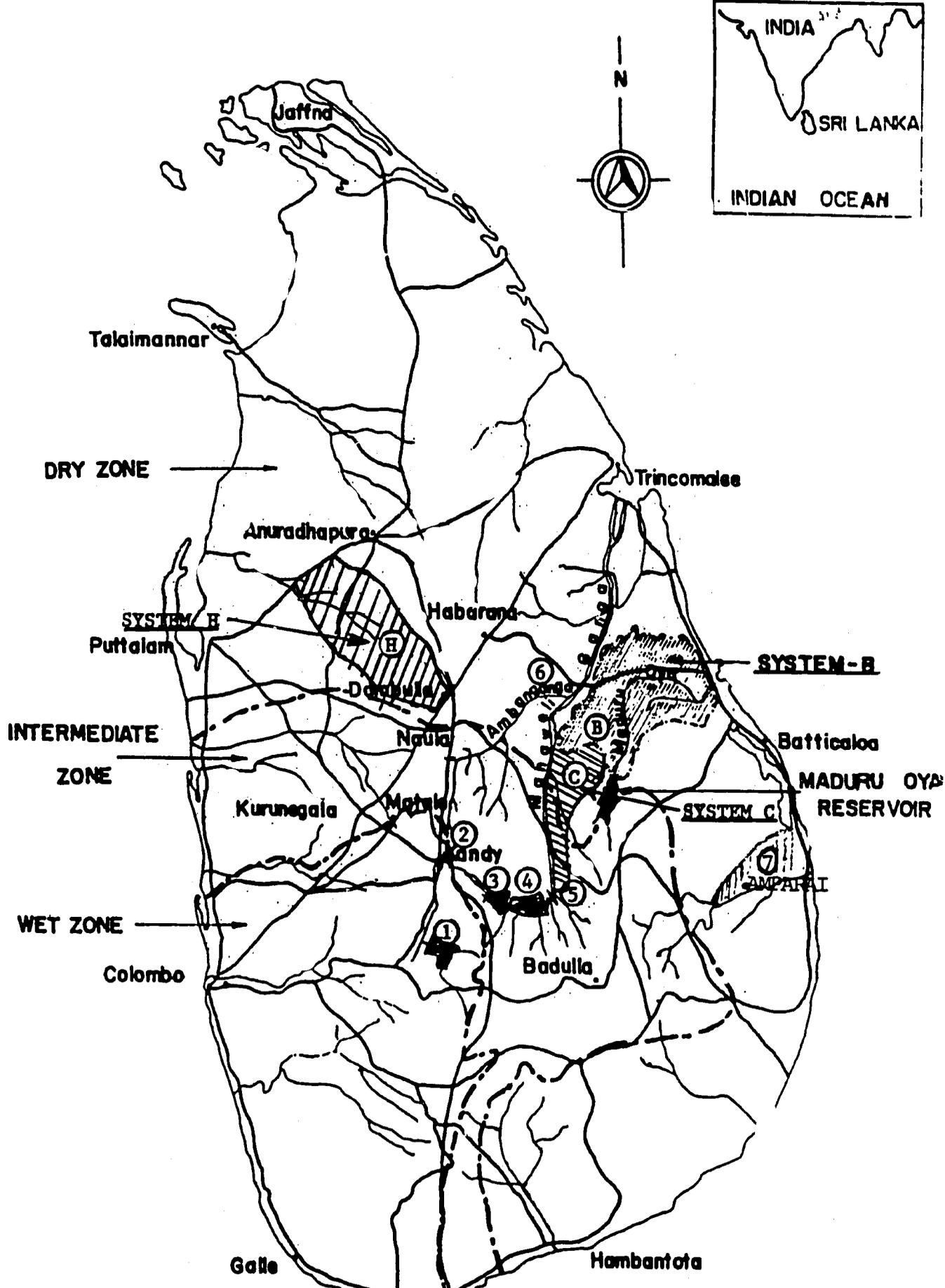
24 Short-term 2/	120
6 Long-term 3/	210
In-country 4/	<u>100</u>
	\$430

C. Evaluation 235

D. Consumables/Non-consumables (Annex F) 697

Total Grant \$3,000

- 1/ Estimated at \$13,000 per pm.
- 2/ Estimated at \$5,000 each.
- 3/ Estimated at \$35,000 each.
- 4/ Estimated at \$100,000 each.



- ①. Kotmale Dam
- ②. Polgolla Diversion
- ③. Victoria Dam
- ④. Randenigala Dam
- ⑤. Minipe Diversion
- ⑥. Polónnaruwa
- ⑦. Galoya Rehabilitation

LEGEND

--- AGRO-ECOLOGICAL ZONE BOUNDARY

— PRINCIPAL ROADS

0 20 40 60 80 100km

SCALE

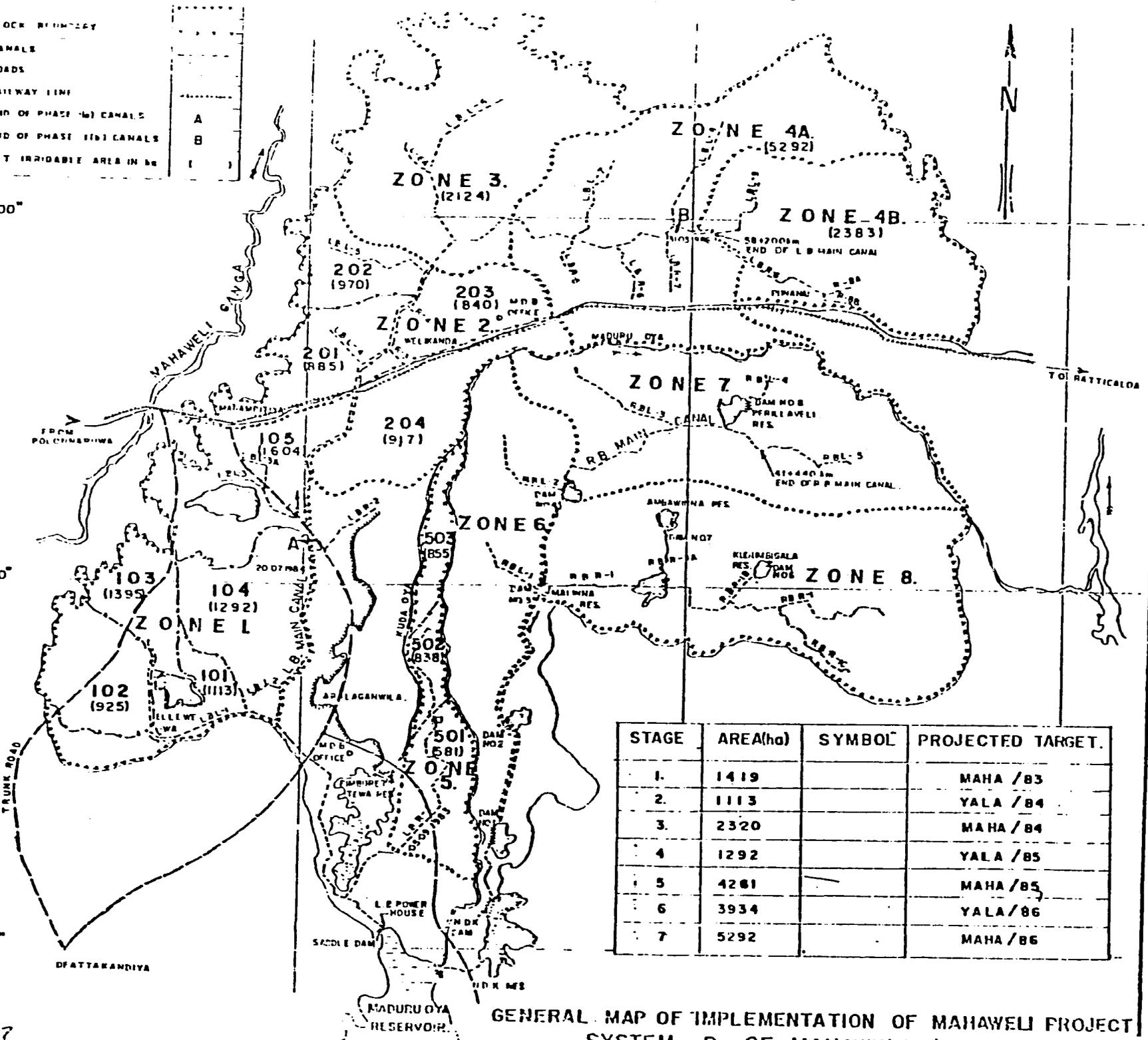
BLOCK NUMBER
 CANALS
 ROADS
 RAILWAY LINE
 END OF PHASE (A) CANALS
 END OF PHASE (B) CANALS
 NET IRRIGABLE AREA IN HA

A
 B
 ()

8°00"

7°50"

7°40"



STAGE	AREA(ha)	SYMBOL	PROJECTED TARGET.
1.	1419		MAHA /83
2.	1113		YALA /84
3.	2320		MAHA /84
4.	1292		YALA /85
5.	4261		MAHA /85
6.	3934		YALA /86
7.	5292		MAHA /86

GENERAL MAP OF IMPLEMENTATION OF MAHAWELI PROJECT SYSTEM B OF MAHAWELI PROJECT.

FIG 7

TABLE 1, ANNEX J

DOWNSTREAM INFRASTRUCTURE DEVELOPMENT-SYSTEM B - PHASE 1(a) CONSTRUCTION AREA

JUNE 1983

Block or Village Center	Hamlet Centers	Access Roads	Small Water Tanks	Plan. 3/ Engr. Design	Land Clear. Level.	Market Roads	D&SD Canals	Field Canals	Field Drain	Schools	Gen. 4/ Off. & Facil.	Homestead & Farm Development	Settler 5/ Housing
each	each	Km	each		Acres	Kms.	Kms.	Kms.	Kms.	each	each	each	each
501 Dhaminna	Kandegama Dhaminna Nidhanwala	15 1/100%	5 100%	100%	3425 100%	7 100%	14 35%	25 10%	13 0%	3 Primary 1 Senior 95%	1 Block 3 Hamlet 71%	518 66%	581 42%
502 Diuldamana	Ihalawela Arunapura Maligatenna Diuldamana	25 100%	2 100%	100%	1,750 100%	12 83%	19 59%	44 10%	18 0%	3 Primary 1 Junior 95%	1 Village 4 Hamlet 30%	838 85%	838 68%
503 2/													
101 Ellewewa	Bandangala Ihala Ellewewa Mahadamana	18 100%	5 100%	90%	3,438 10%	9.0 30%	26 50%	36 0%	36 0%	3 Primary 0%	1 Block 3 Hamlet 0%	1,112 0%	1,112 0%
102 Ellewewa	Kalukelle Etapolonokada	12 100%	3 100%	90%	2,988 65%	7.5 10%	19.0 15%	24 0%	24 0%	1 Primary 1 Senior 0%	1 Village 2 Hamlet 5%	925 0%	925 0%
103 Pelatiyawa	Maguldamana Pahala Ellewewa Pelatiyawa	10 100%	5 100%	90%	4,033 0%	5.5 0%	28 0%	36 0%	36 0%	2 Primary 1 Junior 0%	1 Village 3 Hamlet 8%	1,394 0%	1,394 0%
104 Village Center to be designated	6 Hamlet Centers to be developed	32 50%	6 100%	70%	3,750 0%	10.2 0%	44 0%	46 0%	46 0%	6 Primary 1 Junior 0%	1 Village 6 Hamlet 0%	1,290 0%	1,290 0%
Totals	21 71%	120 87%	26 100%	90%	18,384 35%	51.2 40%	150 14%	211 3%	173 0%	23 33%	27 18%	6,140 17%	6,140 13%

Zone 5 - 70% complete, Zone 1 - 24% complete, overall Phase 1(a) Project area - 38% complete,

1/ Upper figure signifies quantity planned. Lower figure signifies percentage completed of that quantity as of June 1983.

2/ Block 503 is in a flood area. Work on it has been deferred until 1985.

3/ Master planning, engineering and design include the development of a land use plan showing all canals, upland and paddy irrigated areas, water tanks access roads and market roads.

4/ Typically includes administrative offices, staff housing, stores, medical facilities (midwife quarters, clinic, dispensary etc.), service centers, post office facilities, and cooperative stores.

5/ Includes quarters, well, latrine, and fencing.

TABLE 2, ANNEX J
PROJECTED ANNUAL EXPENDITURES (\$000)

	UPTO 12/31/81	PROJECTED ANNUAL EXPENDITURES (\$000)			1985	1986	1987	1988	TOTAL
		1982	1983	1984					
I. AID CONTRIBUTION									
A. Technical Assistance Package (Grant)									
1. Short Term/Long Term Training (in-country and U.S. of A)	-	-	-	130.0	250.0	50.0	-	-	430.0
2. Technical Assistance (Planning, Monitoring, Research and Design/O&M).	-	-	-	546.0	780.0	312.0	-	-	1,638.0
3. Commodities (Training and O&M Consumables and Non-Consumables)	-	-	-	297.0	400.0	-	-	-	697.0
4. Evaluation	-	-	-	50.0	135.0	50.0	-	-	235.0
Sub-Total	-	-	-	1,023.0	1,565.0	412.0	-	-	3,000.0
B. Main and Branch Canals (Loan)									
O&M Equipment	-	12,126.0	24,371.0	27,273.0	27,750.0	380.0	-	-	91,900.0
Escalation	-	-	-	2,264.0	2,304.0	32.0	-	-	4,600.0
Contingencies	-	-	2,597.0	2,906.0	2,957.0	40.0	-	-	8,500.0
Sub-Total	-	12,126	26,968.0	32,443.0	35,011.0	452.0	-	-	107,000.0
Sub-Total (A & B)		12,126.0	26,968.0	33,466.0	36,576.0	864.0	-	-	110,000.0
II. GSL CONTRIBUTION									
C. Downstream Works									
1. Left Bank Irrigation System (Tertiary canals, drains)	1,550.0	708.0	1,970.0	2,783.0	3,662.0	3,854.0	3,650.0	1,298.0	19,475.0
2. Roads (Primary, village, market access and ADB roads)	1,181.0	120.0	4,927.0	4,999.0	5,245.0	1,579.0	1,825.0	1,267.0	21,143.0
3. On-Farm Development and Land Clearing	305.0	588.0	1,161.0	1,925.0	1,933.0	2,412.0	1,933.0	-	10,257.0
4. Settlement Assistance	20.0	1,076.0	1,009.0	1,879.0	1,517.0	2,042.0	1,738.0	-	9,281.0
5. Social and Administrative Infrastructure	3,486.0	1,812.0	4,087.0	7,300.0	5,742.0	6,871.0	3,358.0	-	32,656.0
Sub-Total	6,542.0	4,3020.0	9,744.0	15,467.0	14,679.0	16,758.0	12,504.0	2,565.0	92,811.0
6. Escalation/Contingencies	-	316.0	2,100.0	6,071.0	8,717.0	13,167.0	12,962.0	3,785.0	47,116.0
Sub-Total	6,542.0	4,618.0	11,844.0	21,538.0	23,396.0	29,925.0	25,466.0	6,350.0	139,928.0
D. Main and Branch Canal									
Sub-Total (C & D)	-	121.0	266.0	336.0	342.0	5.0	-	-	1,070.0
TOTAL (A+B+C+D)	6,542.0	4,739.0	15,520.0	25,294.0	23,158.0	29,930.0	25,466.0	6,350.0	140,999.0
TOTAL (A+B+C+D)	6,542.0	16,865.0	42,488.0	58,760.0	63,734.0	30,794.0	25,466.0	6,350.0	250,999.0

NOTE: Slight variations due to rounding.

1/ Average yearly rupee exchange rate used through 1983 and Rs.24 = \$1 through 1988. 2/ADB roads - 1984 and 1985 construction.

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PADDY: ECONOMIC CROP BUDGET SUMMARY ^{1/}

	1979 Prices		1982 Prices	
	IR Soil	2R Soil	IR Soil	2R Soil
Target Yield (tonnes)	4.6	4.1	4.6	4.1
Economic Price (Rs/t)	3,467	3,467	6,161	6,161
<u>Gross Value of Production (Rs.)</u>	15,948	14,215	28,341	25,260
<u>Cost of Production (Rs.)</u>				
Fertilizer	1,281	1,281	2,360	2,360
Crop Protection	399	399	658	658
Farm Power	1,800	1,800	2,970	2,970
Labor	1,050	1,050	1,733	1,733
Miscellaneous	863	863	1,424	1,424
	5,393	5,393	9,145	9,145
Net Value	10,555	8,822	19,196	16,115
Annual Economic Return ^{2/}	18,852	15,756	34,283	28,781
Average Return - Left Bank ^{3/}	17,149		31,257	
Increase in Paddy Benefits		$\frac{1982 \text{ Return}}{1979 \text{ Return}} =$	$\frac{31,257}{17,149} =$	1.82

^{1/} Source Acres International Ltd., Maduru Oya Development Project, April 1982

^{2/} Annual Economic return based on two crops, Maha and Yala, as follows:

Maha : .98 cropping intensity x .95 net area (bund losses) = .931 x net value
 Yala : .90 cropping intensity x .95 net area (bund losses) = .855 x net value

^{3/} Based on weighting factors derived from the following net irrigable areas:

1R = 9,235 ha (0.45%), 2R = 11,065 ha (0.55%) = 20,300 ha (100%)

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