

PO: AF 0-0505 42
383-0058

UNCLASSIFIED

AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

PROJECT PAPER

SRI LANKA
DIVERSIFIED AGRICULTURE RESEARCH

383-0058

AUGUST 1984

UNCLASSIFIED

ACTION MEMORANDUM FOR THE DIRECTOR

THRU: Ralph M. Singleton, PD&SP

FROM: Domenick J. Scarfo, Project Officer 

SUBJECT: Authorization of Diversified Agricultural Research Project 383-0058
in FY 1984

Proposal: That you authorize the Diversified Agricultural Research Project (DARP) 383-0058 in the amount of \$11.4 million (of which \$7.9 million is grant funded and \$3.5 million is loan funded).

Discussion: A detailed description of the DARP is included in the attached PP, as well as the usual cost estimates, analyses, implementation plan, etc. The project analyses (Section VII of the PP) demonstrates the viability and desirability of the project.

In brief, the project will assist the Department of Agriculture to undertake an eight-year program aimed at (a) strengthening research (both agronomic and socio-economic) on coarse grains, grain legumes and oil crops, with emphasis on an integrated, multidisciplinary farming systems approach to research and extension; (b) improving technology transfer through the extension and education/training systems; (c) improving seed production and distribution, including an expanded role for the private sector in the production and marketing of certified seed; and, (d) strengthening agriculture sector management capability.

USAID and GSL funds will be used to finance long- and short-term training, including in-country training at the Postgraduate Institute of Agriculture; technical assistance; commodities (laboratory, farm and seed processing equipment, vehicles); construction and renovation of facilities (laboratories, seed processing and storage facilities, staff quarters); new staff; increased operating budget; evaluation; several project workshops; and economic and social research. Assistance will be provided to the Department of Agriculture headquarters in Peradeniya, seven regional research centers, extension facilities and in-service training facilities in the project areas, five seed processing centers, four seed farms and private seed growers and distributors.

This project was developed and designed jointly by appropriate personnel of GSL and USAID. Agreement has been attained between USAID and the GSL on the contents of the attached PP, as well as the Conditions Precedent and Covenants which will be included in the Project Loan and Grant Agreement. The GSL Finance Request is presented in Annex A.4 of the Project Paper. The GSL contribution to the project is the Rupee equivalent of \$5,160,000, which represents a contribution of approximately 31 percent of total project costs.

The PID and PP were both reviewed in AID and the PID approval cable (State 209586, dated 7/27/83) approved a negative initial environmental examination for the project. The AA/ASIA has approved the source/origin and 636(i) vehicle waivers requested in Annex A.6 of the PP (see paragraph 11 of State 180857). All A.I.D. legal and statutory requirements have been satisfied (completed Statutory Checklist is included as Annex A3 in the PP). AID has advised (State 194337, dated 7/2/84) that the Congressional Notification waiting period has expired and that you may sign the Project Authorization. The above cable also states that \$790,000 and \$1,960,000 from the ARDN account, grant and loan funds respectively, can be obligated in FY 1984.

Recommendation: That you sign the attached Project Authorization to permit the signing of a Project Loan and Grant Agreement to obligate loan and grant funds in Fiscal Year 1984.

Approved: F. Conrad

Disapproved: _____

Date: August 9th 1984

Clearance: KLeBlanc:CONT (draft)

TAMuntsinger:LA (draft)

JWBonner:ARD (draft)

JGunning:ASIA/PNS (draft)

AID:PDSP:CSchoux:DScarfo:am:8/8/84

PROJECT AUTHORIZATION

Sri Lanka

Diversified Agriculture Research
Project No. 383-0058
A.I.D. Loan No. 383-T-033

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Diversified Agriculture Research Project for Sri Lanka involving planned obligations of not to exceed Three Million Five Hundred Thousand Dollars (\$3,500,000) in loan funds and Seven Million Nine Hundred Thousand Dollars (\$7,900,000) in grant funds over a five-year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help finance foreign exchange and local currency costs of the project. The planned life of the project is eight years from the date of initial obligation.

2. The project will strengthen Sri Lanka's institutional capability to develop and transfer to small farmers in Sri Lanka improved technologies and seed required to increase and sustain production of subsidiary field crops, including coarse grains, pulses, oil seeds, and others. The project will consist of four main components: (A) increasing and upgrading the capabilities and facilities of the Department of Agriculture to program and carry out farmer-relevant research, with direct farmer participation, in improved subsidiary field crop production practices under both rainfed and irrigated conditions in the dry and intermediate zones, (B) expansion of extension services and the capabilities of extension personnel to give increased attention to improved technologies in subsidiary field crop production, (C) improvements in subsidiary field crop seed production, processing, and marketing, with emphasis on increasing the role of the private sector to ensure the supply of quality seed of improved varieties, and (D) increasing the management capability of the Department of Agriculture.

3. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to the following essential terms and conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

4. Interest Rate and Terms of Repayment

Sri Lanka shall repay the Loan to A.I.D. in U.S. Dollars within forty (40) years from the date of first disbursement of the Loan, including a grace period of not to exceed ten (10) years. Sri Lanka shall pay to A.I.D. in U.S. Dollars interest from the date of first disbursement of the Loan at the rate of two percent (2%) per annum during the first ten (10) years, and three percent (3%) per annum thereafter, on the outstanding disbursed balance of the Loan and on any due and unpaid interest accrued thereon.

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5. Source and Origin of Commodities and Nationality of Suppliers

Except as otherwise provided in A.I.D. Handbook 10 in respect of participant training, and except as A.I.D. may otherwise agree in writing, commodities financed by A.I.D. shall have their source and origin, and the suppliers of commodities or services financed by A.I.D. shall have their place of nationality, in countries included in A.I.D. Geographic Code 941 or Sri Lanka when loan financed and, except for ocean shipping, in the United States of America or Sri Lanka when grant financed. Ocean shipping when grant financed shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States of America.

6. Conditions Precedent to Disbursement

a. Prior to any disbursement, or to the issuance of any commitment documents under the Project Agreement, Sri Lanka shall furnish in form and substance satisfactory to A.I.D. :

- (1) Evidence that a Project Coordinating Committee acceptable to A.I.D. and a Project Management Unit acceptable to A.I.D. have been established and that a Project Manager acceptable to A.I.D. has been designated, and
- (2) Evidence that adequate budgetary resources for Project needs in 1985 are being included in the Government's budget for that year.

b. Prior to the issuance of any commitment documents under the Project Agreement for training, Sri Lanka shall furnish in form and substance satisfactory to A.I.D. a detailed training plan for all long- and short-term training to be funded under the Project.

c. Prior to the issuance of any commitment document under the Project Agreement for Fixed Amount Reimbursement of construction, Sri Lanka shall furnish in form and substance satisfactory to A.I.D. evidence that a contract or contracts for the engineering design and construction supervision of all project-financed construction have been executed.

7. Covenants

Sri Lanka shall covenant :

a. To ensure that sufficient numbers of qualified professional and support staff to meet the needs of the Project are hired and assigned to the Project in a timely manner.

b. To ensure (1) that all participant training financed by A.I.D. under the Project will be accomplished in accordance with the policies, allowances, and reporting requirements in A.I.D. Handbook 10, (2) that employment in a position relevant to the training received under the Project will be available for each participant immediately upon completion of his or her training and for a period thereafter of not less than one year, or not less than three times the length of the training, whichever is longer, and (3) that no action will be taken by the Government to waive or relax any post-training obligation of any participant without prior A.I.D. approval.

c. To promulgate a national seed policy that will regulate, support, and encourage the development of the seed industry in Sri Lanka, including an expanded private sector role in seed production and marketing.

d. To closely monitor land use in the dry and intermediate zones of Sri Lanka and actively promote rational land use, including watershed protection, enforcement of limits on chena cultivation, and regularization of tenure.

Signature: Frank D. Correl
Frank D. Correl
Director
USAID/Sri Lanka

Date: August 9th 1984

PROJECT DATA SHEET

1. TRANSACTION CODE

A = Add
 C = Change
 D = Delete

Amendment Number

DOCUMENT CODE

3

COUNTRY/ENTITY
 SRI LANKA

3. PROJECT NUMBER

383-0058

4. BUREAU/OFFICE
 Bureau for Asia 04

5. PROJECT TITLE (maximum 40 characters)

Diversified Agriculture Research

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)

MM DD YY
 08 31 92

7. ESTIMATED DATE OF OBLIGATION

(Under "B." below, enter 1, 2, 3, or 4)

A. Initial FY 84 B. Quarter C. Final FY 88

8. COSTS (\$000 OR EQUIVALENT \$1 =)

A. FUNDING SOURCE	FIRST FY 84			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total	414	336	2,750	9,900	1,500	11,400
(Grant)	(770)	(20)	(790)	(7,550)	(350)	(7,900)
(Loan)	(644)	(316)	(1,960)	(2,350)	(1,150)	(3,500)
Other						
U.S.						
Host Country					5,160	5,160
Other Donors)						
TOTALS	414	336	2,750	9,900	6,660	16,560

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECIL 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) ARDN	210	968	968			7,900	3,500	7,900	3,500
(2)									
(3)									
(4)									
TOTALS						7,900	3,500	7,900	3,500

10. SECONDARY TECHNICAL CODES (maximum 5 codes of 3 positions each)

080 070 011 020 312

11. SECONDARY PURPOSE CODE

110

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

A. Code BS B/AG FNV EQTY NUTR PART TECH
 B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

To strengthen the institutional capability to generate and effectively transfer technologies and seed required to increase and sustain subsidiary field crop production on small farms.

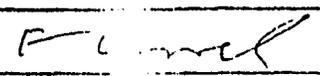
14. SCHEDULED EVALUATIONS

Interim MM YY MM YY Final MM YY
 04 87 09 88 05 92

15. SOURCE/ORIGIN OF GOODS AND SERVICES

G and L
 000 G 941 L Local/ Other (S. 17)

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

17. APPROVED BY	Signature 	Date Signed MM DD YY 08 09 84	18. DATE DOCUMENT RECEIVED IN AID/AMENDMENTS, DATE OF DISTRIBUTION MM DD YY
	Title Frank D. Correl Mission Director		

Diversified Agriculture Research
Project 383-0058

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ACRONYMS AND TERMS

ADA	-	Assistant Director of Agriculture
ADAB	-	Asutralian Development Assistance Bureau
ADD	-	Additional Deputy Director (Agriculture)
AEARP	-	Agricultural Extension and Adaptive Research Project (World Bank-supported)
AI	-	Agricultural Instructor
AO	-	Agricultural Officer
ARS	-	Agricultural Research Station
ARTI	-	Agrarian Research and Training Institute
ASC	-	Agrarian Service Center
AVRDC	-	Asian Vegetable Research and Development Center
CIDA	-	Canadian International Development Agency
CIMMYT	-	International Center for Maize and Wheat Improvement
CRSP	-	Collaborative Research Support Project (USAID)
DA	-	Director of Agriculture
DARP	-	Diversified Agriculture Research Project
DOA	-	Department of Agriculture
FAO	-	Food and Agriculture Organization of the United Nations
FSR	-	Farming Systems Research
GSL	-	Government of Sri Lanka
IARC	-	International Agricultural Research Center
ICARDA	-	International Center for Agricultural Research in Dry Areas
ICRISAT	-	International Crop Research Institute for the Semi-Arid Tropics
LDRC	-	International Development Research Center
IFAD	-	International Fund for Agricultural Development
IIMI	-	International Institute for the Management of Irrigation
IITA	-	International Institute for Tropical Agriculture
INTSOY	-	International Soybean Program
IRRI	-	International Rice Research Institute
ISNAR	-	International Service for National Agricultural Research
ISTI	-	In-Service Training Institute (Regional)
KVS	-	Village Level Agricultural Extension Staff
Maha	-	Principal rainy and cultivation season (Sept.-Dec.)
NIFTAL	-	Nitrogen Fixation Project (University of Hawaii)
PGIA	-	Post Graduate Institute of Agriculture (Peradeniya)
RRC	-	Regional Research Center
RTWG	-	Regional Technical Working Group
SCS	-	Seed Certification Service
SFC	-	Subsidiary Field Crops
SMO	-	Subject Matter Officer
SMS	-	Subject Matter Specialist
USAID	-	United States Agency for International Development
UNDP	-	United Nations Development Program
Yala	-	Second cultivation season (May-July)

Project-Assisted Research Centers/Stations

APL	-	Angunakolapelessa
BAND	-	Bandarawela
GIR	-	Girandurukotte
KA	-	Karadiyan Aru
KLL	-	Killinochchi
MI	-	Maha Illuppallama
MAK	-	Makandura

ACRONYMS AND TERMS, Con't.

Project-Assisted Seed Processing Centers/Farms

ALU	-	Aluththarama
BAT	-	Bata Ata
NIK	-	Nikaweratiya
PAR	-	Paranthan
PEL	-	Pelwehera

DOA Headquarters

PER	-	Peradeniya
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I. DRAFT PROJECT AUTHORIZATION

Sri Lanka

Diversified Agriculture Research
Project No. 383-0058
A.I.D. Loan No. 383-F-033

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2. The project will strengthen Sri Lanka's institutional capability to develop and transfer to small farmers in Sri Lanka improved technologies and seed required to increase and sustain production of subsidiary field crops, including coarse grains, pulses, oil seeds, and others. The project will consist of four main components: (A) increasing and upgrading the capabilities and facilities of the Department of Agriculture to program and carry out farmer-relevant research, with direct farmer participation, in improved subsidiary field crop production practices under both rainfed and irrigated conditions in the dry and intermediate zones, (B) expansion of extension services and the capabilities of extension personnel to give increased attention to improved technologies in subsidiary field crop production, (C) improvements in subsidiary field crop seed production, processing, and marketing, with emphasis on increasing the role of the private sector to ensure the supply of improved varieties of quality seed, and (D) increasing the management capability of the Department of Agriculture.

3. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to the following essential terms and conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

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- (1) Evidence that a Project Coordinating Committee acceptable to A.I.D. and a Project Management Unit have been established and that a Project Manager acceptable to A.I.D. has been designated, and
- (2) Evidence that adequate budgetary resources for Project needs in 1985 are programmed for inclusion, or have been included, in the Government's budget for 1985.

b. Prior to the issuance of any commitment documents under the Project Agreement for training, Sri Lanka shall furnish in form and substance satisfactory to A.I.D. a detailed training plan for all long- and short-term training to be funded under the Project.

c. Prior to the issuance of any commitment document under the Project Agreement for Fixed Amount Reimbursement of construction, Sri Lanka shall furnish in form and substance satisfactory to A.I.D. evidence that a contract for the engineering design and construction supervision of all Project-financed construction has been executed.

7. Covenants

Sri Lanka shall covenant :

a. To ensure that sufficient qualified professional and support staff to meet the needs of the Project are hired and assigned to the Project in a timely manner.

b. To ensure (1) that all participant training financed by A.I.D. under the Project will be accomplished in accordance with the policies, allowances, and reporting requirements in A.I.D. Handbook 10, (2) that employment in a position relevant to the training received under the Project will be available for each participant immediately upon completion of his or her training and for a period thereafter of not less than one year, or not less than three times the length of the training, whichever is longer, and (3) that no action will be taken by the Government to waive or relax any post-training obligation of any participant without prior A.I.D. approval.

c. To promulgate a national seed policy that will regulate, support, and encourage the development of the seed industry in Sri Lanka, including an expanded private sector role in seed production and marketing.

d. To closely monitor land use in the dry and intermediate zones of Sri Lanka and actively promote rational land use, including watershed protection, enforcement of limits on chena cultivation, and regularization of tenure.

Signature _____
Frank D. Correl
Director
USAID/Sri Lanka

Date _____

II. SUMMARY AND RECOMMENDATIONS

A. Recommendations

1. That a development loan of \$3,500,000 be authorized to the Government of Sri Lanka to be disbursed over eight years with a 40-year repayment period including a 10-year grace period at 2 percent interest and 3 percent interest thereafter;
2. That a development grant of \$7,900,000 be authorized to the Government of Sri Lanka to be disbursed over eight years; and,
3. That a procurement source/origin waiver be authorized from Code 000 (U.S. only) to Geographic Code 935 (Special Free World) to permit the procurement of 10 passenger vehicles, 43 motorcycles, and nine four-wheel drive, double cab pickup trucks for use in the project (Annex A.6).

B. Summary Project Description

Sri Lanka is nearing self-sufficiency in rice, its staple food grain. Given present trends and new Mahaweli lands still to come into production, a decline in rice prices together with decreased profitability of rice farming in the lower productivity areas are expected. At the same time, prospects for rice export are nonexistent, at least in the foreseeable future.

While the country is approaching self-sufficiency in rice, there is a growing deficit in coarse grains (primarily for livestock and poultry rations), grain legumes, oil crops, and poultry and livestock products. The Government of Sri Lanka (GSL), recognizing the need to maintain stable farm incomes and reduce foreign exchange expenditures, and conscious of the declining nutritional status and inefficient land and water use, has moved from a policy of rice self-sufficiency to food self-sufficiency — i.e., towards agricultural diversification with special emphasis on subsidiary crops under both rainfed and irrigated conditions.

Diversification in field crop production, however, faces technological and institutional constraints. Because of the past emphasis on rice production, the SFC have been generally neglected. Research work on the SFC has not been effectively supported and directed, with the result that relatively few appropriate, improved production technologies have been developed. This neglect has carried through to the seed and extension programs, with the net result that both prevailing SFC production technologies, as well as the infrastructure to generate and support improvements, have remained at very low levels of development.

The purpose of the project is to strengthen the institutional capability to generate and effectively transfer technologies and seed required to increase and sustain SFC production on small farms.

To accomplish this objective, the project will assist in upgrading the capability of the Department of Agriculture (DOA) to program and carry out sound agro-climatological and farmer-relevant research; effectively transfer new and adapted technologies to farmers; and ensure the supply of quality SFC seed. Private sector efforts will be enlisted in undertaking the latter. The project is an institution building effort, assisting the DOA to strengthen its capability vis a vis subsidiary field crops while maintaining a strong program in rice. This will entail a quantitative and qualitative expansion in staff;

strengthened management capability; improved facilities for research, seed production/processing, and staff housing at remote locations; more and better equipment to support SFC activities; increased mobility for DOA staff; and increased funding for SFC-related programs. In a major innovation, the project will introduce and seek to institutionalize an integrated, multi-disciplinary farming systems approach to research and extension. In a departure from traditional Sri Lankan agriculture, support for sustainable SFC production will also be directed at irrigated lands, particularly in the Mahaweli area where up to an estimated 40 percent of the irrigable land is unsuited for paddy production (due largely to soil conditions).

AID funds will assist in financing the project's four principal components: strengthened SFC research capability (\$5.495 million); improved extension (\$1.541 million); improved seed production and distribution (\$3.056 million); and strengthened management capability (\$1.307 million). The Government of Sri Lanka will contribute \$5.160 million, or 31 percent of total project costs. Major project inputs include technical assistance; long- and short-term training, some of which will be provided in country at the Postgraduate Institute of Agriculture; commodities (laboratory, farm and seed processing equipment, vehicles); construction and renovation of facilities (laboratories, seed processing and storage facilities, staff quarters); new staff; operating budget; and funds for evaluation, several project workshops, AID/W central project cost sharing, and economic and social research.

The project will be implemented by the GSL Department of Agriculture. Technical assistance and off-shore training will be provided by a U.S. firm under an AID direct contract. The major share of commodities and equipment will be procured by a U.S. procurement services agent under a host country contract, with the balance procured by the DOA. The DOA will manage project-financed construction with the assistance of a local A&E firm for engineering and construction supervision; construction will be undertaken by local private firms. Economic and social research will be undertaken by the DOA with assistance from the Agrarian Research and Training Institute (ARTI) and other local institutions. ARTI will also provide social service personnel to participate in the multi-disciplinary farming systems research teams. Evaluation will be contracted out through AID direct contracts including IQCs and personal services contracts.

The project will provide assistance to DOA headquarters in Peradeniya, seven regional research centers, extension facilities and In-Service Training Institutes in the project area, five seed processing centers, four seed farms, and private seed growers.

By the end of eight years, the integrated program in subsidiary field crops is expected to result in: (1) Improved SFC varieties and production practices, appropriate to regionally differentiated farming conditions, being identified and disseminated to farmers; (2) research strategies and priorities being set on the basis of farmer and market needs; (3) upgraded and rationalized SFC seed production and marketing system operating to meet a minimum of 10% of annual SFC seed requirements with a growing private sector role in certified seed production and marketing; (4) increased understanding of SFC cropping patterns and of social and economic factors affecting production being reflected in DOA decision making; and (5) an integrated intra-divisional management system for SFC-related activities.

An estimated 909,000 small holder families in the dry and intermediate zones comprise the target group. Of these, approximately 512,000 families (20 percent of Sri Lanka's population) are expected to benefit directly through increased income and employment.

C. Summary Findings

Based on the analyses contained in Parts IV and VII and Annexes B.1-9 of the Project Paper, the project has been determined to be technically, economically, financially, socially, administratively, and environmentally sound and ready for implementation. Project feasibility was thoroughly assessed by a five-person team of U.S. consultants (See E., following) in November and December 1983 and by USAID and GSL staff in the 10 months following AID/W approval of the PID. In addition, the project was developed in consultation with a wide variety of U.S. and international technical experts (and their reports on Sri Lankan agriculture) including staff of the International Service for National Agricultural Research (ISNAR); Dr. Albert H. Moseman of the World Bank; Dr. C. Brice Ratchford, University of Missouri; Dr. George Beinhart, USDA; and, from AID/Washington, Drs. Ralph Cummings, Jr., Raymond Meyer, Ronald Follett, and Robert Stewart and Messrs Richard Hughes and John O'Donnell.

The project meets all statutory criteria (see Statutory Checklists, Annex A.3, and Mission Director's 611(e) Certification, Annex A.5).

D. APAC Concerns

The preliminary project proposal (PID) was approved by the Asia Projects Advisory Committee (APAC) on July 8, 1983. In its approval message (State 209586-see Annex A.1), the APAC presented a number of concerns and suggestions for Mission consideration in developing the project and preparing the Project Paper. Key concerns are addressed below:

1. Project Focus and Objectives: The project is focussed on SFC research with some support to extension, seed production and distribution, and overall management capability to ensure that research results and needed inputs are effectively transmitted to target group farmers. The Technical Analysis describes preliminary research objectives and criteria used in their selection and for application in future research programming.

2. GSL Policies: The GSL policy environment relevant to the SFC is basically sound. The market is unregulated, with prices free to find their own levels above a producer floor price. Imports of SFC do take place, often to accommodate seasonal supply fluctuations and production shortfalls owing to inclement weather, but the importance of maintaining adequate producer prices is recognized, and the MADR must concur in import decisions. The existing floor price scheme needs to be made more effective; the project will encourage close monitoring of the market environment and promotion of market development, including enhanced effectiveness of the floor price scheme.

The general policy environment for agriculture has undergone significant positive changes over the past six years, a process which is continuing. The AID-supported National Agriculture, Food and Nutrition Strategy (NAFNS) is lending impetus to this process. Major problem areas that remain include seed policy, land tenure and credit. An effective national seed policy is likely to be adopted in the near future, and is the subject of a project covenant. Agricultural credit is a major GSL concern; several new proposals are under active consideration, strongly supported by the NAFNS. Land tenure and settlement problems are recognized, and are the subject of a project covenant.

3. Seed Production Strategy: The project proposes a two-fold strategy: (1) providing the Seed Division of the Department of Agriculture with improved infrastructure for the production of foundation and registered seed, certification

of the latter two classes of seed and commercial seed, seed processing, and minor improvements in seed distribution; and (2) consonant with rising producer demand for commercial seed, promotion and support of a growing role for the private sector in the production and marketing of commercial seed. As participation becomes more financially attractive to private entrepreneurs, AID's Private Enterprise Promotion Project or PRE funds may be tapped to finance feasibility studies for this new industry and potentially some seed capital and technical assistance for its establishment.

4. Marketing: A Subsidiary Food Crops Marketing Study was completed by a Sri Lankan consulting firm, Agroskills Ltd., in October of 1983. The study concluded that marketing problems will not be a major bottleneck to expansion of subsidiary crops. The portion of SFC produce that enters the market channel in the principal growing areas in the Maha season generally exceeds 80 percent, and the market structure appears reasonably efficient. There is a high degree of competition among traders. Traders have fair access to price information, and the entry of new traders into the market is relatively unrestricted. An analysis of the trader margins shows that producers receive a very high share of the final wholesale price - in many cases more than 80 percent of the price. The Mission believes that the Agroskills study provides the necessary analysis of the marketing situation in order to proceed with the project.

5. Research Management: Research organization, management and administrative mechanism are fully described in the Technical and Administrative Analyses. The farming systems approach to research and extension, to be introduced and institutionalized under the project, research--extension--farmer linkages, and inputs into GSL policy formulation are discussed in the Project Description and Technical Analysis. Inadequate working and living conditions for DOA staff, and project plans to address these constraints, are discussed throughout the Project Paper.

6. Soil-water Management and Agroclimatology: The project will address soil and water management constraints under rainfed and irrigated conditions through specifically targeted technical assistance and training (see Project Rationale and Description). SFC research, as demonstrated throughout the Project Paper, will be programmed to be responsive to differentiated farming conditions, including agroclimatological factors. Indeed, as noted in the PP, one of the project's principal benefits will be increased conservation of the soil and water resource base through the adoption of agro-ecologically improved upland cropping systems and more suitable uses of well-drained lands in the Mahaweli area.

7. Nutrition: The Mission has already developed linkages with the relevant nutrition institutions, in this case the Food Nutrition Policy Planning Division of the Ministry of Plan Implementation. During the past year, it has provided a nutrition planner to work with FNPPD in developing a national nutrition plan. This information has, in turn, been fed into the National Agriculture, Food and Nutrition Strategy being developed. The Mission will continue to work with FNPPD over the next two years through an AID-supported International Food Policy Research Institute collaborative analysis of the GSL food stamp program. Nutritional impact is included as a criterion in research programming, and increased consumption of subsidiary food crops and animal protein is expected to be a major outcome of the project.

8. Forage and Livestock: As noted in the Technical Analysis, the Farm Level Surveys will cover livestock-related information, and the research work under this project will explicitly address the potential for forage in upland crop rotations. However, direct project involvement with livestock, at least in the initial stages of implementation, is not feasible for administrative/management reasons as outlined in the Technical Analysis.

9. Coarse Grains Substitution: Of the coarse grains, only maize is being singled out for attention in the initial stages of project implementation. The main market for expanded maize production is the feed industry; other agro-industrial uses are more remote prospects. The coarse grains as a group are not preferred foods, and the potential for substitution for wheat is quite limited, especially in view of Sri Lanka's projected demand for wheat.

10. Food Security: Effective self-sufficiency in rice, the country's staple food grain, is expected over the next several years as a result of increasing productivity through improved varieties and management practices, expanded acreage (to increase as new Mahaweli lands are brought into production), and an adequate floor price. The GSL plans to continue allocating the resources required to maintain high rice yields. The project, furthermore, will provide continued, limited support to Sri Lanka's rice research program, by enabling the DOA to maintain its international professional technical contacts in rice (primarily with IRRI) and for expanding rice-based cropping systems research which is critical to dry and intermediate zone agriculture, much of which is rice-based.

E. Project Contributors and Review Committee

A program in subsidiary field crops has been under discussion with the GSL since 1979. This project is the result of approximately two years of collaborative effort between AID and the GSL, assisted by a variety of consultants. The Project Paper reflects close AID/GSL collaboration and mutual understanding of the project's objectives and planned implementation.

The following individuals are the principal contributors to the design of the project, the preparation of required studies, and/or to the preparation of the Project Paper.

USAID/Sri Lanka

Charles M. Uphaus, Project Officer and Chairman, Project Committee
 Christina H. Schoux, Project Development Officer
 Michael J. Korin, Chief, Agriculture and Rural Development
 Kathleen Le Blanc, Financial Analyst
 Lee Ann Ross, Economist
 Eric R. Loken, Environmental Officer
 Herbert G. Blank, Civil Engineer
 Senaka Abeyratne, Agricultural Economist

Government of Sri Lanka

Department of Agriculture:

Dr. Walter Fernando, Director of Agriculture
 Dr. Nimal Ranaweera, Deputy Director for Agricultural Economics and Projects, and his staff
 Dr. Irwin Gunawardena, Deputy Director for Research
 Mr. S. Charles and Mr. W.A. Albert, Deputy Director and Additional Deputy Director, respectively, for Seeds
 Mr. S. Natesan and Mr. Stanley Wijegunawardena, successive Deputy Directors for Education & Training
 Mr. Percy Abeywardena, Deputy Director for Extension
 Mr. Mahrouf, Extension Specialist
 Mr. Lakamwasam, Research Specialist

Design Team Consultants

Guy B. Baird, (Team Leader), International Agricultural Development Services (IADS)

Loy V. Crowder, IADS

Victor S. Doherty, International Science and Technology Institute, Inc. (ISTI)

Yacob Fisseha, ISTI

John I. Sutherland, ISTI

USAID Executive Project Review Committee

Frank D. Correl, Mission Director

William P. Schoux, Deputy Mission Director

John M. Miller, Program Officer

Michael J. Korin, Chief, Agriculture and Rural Development

Leroy Purifoy, Chief, Mahaweli and Water Resources

Arthur D. Schantz, Controller

Thomas A. Muntsingher, Legal Advisor

III. PROJECT RATIONALE AND DESCRIPTION

A. Background

Agriculture in Sri Lanka is at a critical juncture as the country nears self-sufficiency in rice, its staple food grain. Rice imports have declined steadily over the past six years as a result of increased productivity through improved varieties and management practices, expanded acreage, and an adequate floor price. Given present trends and the new Mahaweli lands still to come into production, it is likely that effective self-sufficiency will be attained over the next several years. Downward pressure on prices and decreased profitability of rice farming in the lower productivity areas can be anticipated. At the same time, recent studies have confirmed that prospects for significant exports of rice are highly dubious at best. Sri Lanka has neither the right varieties, the physical infrastructure, nor the natural endowment for economic production for the international market.

While the country is approaching self-sufficiency in rice, there is a growing deficit in coarse grains (primarily for livestock and poultry rations), grain legumes, oil crops, and poultry and livestock products. The Government of Sri Lanka (GSL), recognizing the need to maintain stable farm incomes and reduce foreign exchange expenditures, and concerned with declining nutritional status and inefficient land and water use, has changed from a policy of rice self-sufficiency to maximizing food self-sufficiency - i.e., towards agricultural diversification with special emphases on subsidiary crops. Evidence of this change includes (a) the development by the Ministry of Agricultural Development and Research of a Five Year Development Plan for Cultivation of Subsidiary Food Crops which calls for a doubling of production, under both rainfed and irrigated conditions, within six years through intensified research, extension, and increased production of quality seed material; and, (b) improvement of the GSL's floor price scheme which now includes most of the subsidiary field crops (SFC).^{*} In addition, the Mahaweli Authority of Sri Lanka, mindful of the low export potential for rice as well as the present and prospective misuse of water for production of rice on well-drained soils, is supporting a research program in the SFC, in collaboration with the Department of Agriculture (DOA), and is encouraging diversification away from paddy to the SFC through production inputs and marketing support. The GSL's National Agriculture, Food and Nutrition Strategy, now nearing completion, also makes a strong case for agricultural diversification into the SFC.

The proposed project is in conformity with Agency program emphases on technology transfer and institution building, and with Asia Bureau agricultural research priorities of (1) sustained, high production in relatively favorable (irrigated) areas, and (2) sustained production in less favorable natural resource areas. The Sri Lanka CBS emphasizes both (1) irrigation and water management, and (2) agricultural research, production and marketing. Within the latter category, attention is focused on agricultural diversification within the context of rice self-sufficiency. With its

^{*} The SFC include maize, soybean, finger millet, cowpea, green gram, black gram, sesame, groundnut and several others.

consideration of both irrigated and rainfed production of the subsidiary field crops, the project directly supports a continuing country program emphasis on Mahaweli development, as well as broader agricultural research and production concerns.

The proposed project will not promote expanded SFC production at the expense of continued work on rice. Sustained strong emphasis on rice research is essential if Sri Lanka is to maintain rice yields in the face of constantly changing physical and economic conditions. The GSI clearly recognizes this and plans to continue allocating the resources to maintain its quite successful, sound rice program. (Rice production figures for the years 1978-83 are provided in Annex B.6). Further, most field crop production systems in the dry and intermediate zones are rice based; it is self-defeating, if not impossible, to consider SFC production without reference to rice, and the maintenance of acceptable levels of rice production. Therefore, this project will provide continued, limited support to the country's rice research program, by enabling the IOW to maintain its international professional technical contacts in rice (primarily with IRRI) and for expanding rice-based cropping systems research.

Close coordination will be maintained with the Mission's proposed FY 1985 Mahaweli Agriculture and Rural Development Project; the two projects are designed to be mutually supportive in development of agricultural production on new farmlands (primarily system B), being made available under the Mahaweli program.

B. Constraints to SFC Diversification

Diversification in field crop production faces technological and institutional constraints. Because of the past emphasis on rice production, the SFC have been generally neglected. Research work on the SFC has not been effectively supported and directed, with the result that relatively few appropriate, improved production technologies have been developed. This neglect has carried through to the seed and extension programs with the net result that both the prevailing SFC production technologies, as well as the infrastructure to generate and support improvements, have remained at very low levels of development.

The primary problem is the lack of an adequate research base to support an expanded SFC production program - i.e., to generate tested, improved varieties and farming practices which are responsive to farmers' needs and microecologically appropriate. While the current research system theoretically promotes a two-way flow of information between researchers and farmers, there is relatively little direct farmer participation in actuality. On-farm trials are commonly carried out according to regularized on-station designs and, in general, neither represent nor reflect farmer conditions. Market considerations also appear to play only a minor role in research programming. Thus, current on-station and on-farm research inadequately reflect both farm unit needs and market realities.

In addition to these fundamental programming problems, constraints on research include insufficient funding; lack of a sufficient number of trained staff at senior and mid-grade levels and at the research assistant and other support staff level; lack of specific kinds of staff expertise, e.g., in cropping systems, pest control, soil and water management, and the social sciences; inadequate facilities and equipment; lack of transportation, particularly in the field; and lack of an adequate data collection and analysis system. In many field locations, the lack of such basic needs as housing, utilities, schools, and medical facilities severely retard staff recruitment, morale and retention.

A second problem area is extension. The program and organizational arrangements for technology transfer are basically sound, and good interaction between research scientists and extension personnel is developing. However, the Training and Visitation System introduced in 1979/80 under a world Bank project is still in its infancy and geared primarily to rice production. Weaknesses in the overall extension system need correction before it can meet the needs of SRC diversification. These include better preparation of key categories of staff; application of the farming systems approach to research and extension; and expansion/redirection of the program to focus on the SRC.

Subject matter specialists (SMS'), who have primary responsibility for in-service training of staff, are a newly created cadre. Most SMS' are recent university graduates in need of more experience and skills, particularly with respect to the SRC. There is also an urgent need to upgrade the subject matter officers (who train field-level extension workers) in their areas of specialization and to upgrade the technical qualifications of selected agricultural officers in order to increase their effectiveness with researchers with respect to the SRC. Methodologically, extension staff recommendations and work in on-farm trials and demonstrations rely too much on a "top-down approach," as in the case of research, without sufficient reference to farmers' concerns and market potential or to the interactive nature of farm operations. This deficiency also limits extension input into research, affecting the degree to which work at research facilities reflects what extension personnel deliberately and systematically learn from the farmers and their operations.

A third major problem area is the lack of quality SRC seed and the infrastructure to support its production and distribution. At the present time, the mixed public/private seed production system is able to meet only five percent of the annual requirement for SRC seed, the balance - low in quality and reliability - coming from farmers' own stocks or informal supply networks. The seed program suffers from a series of interrelated problems: inadequate capacity in production, storage, and processing; inadequate quality control; a poor distribution system which, among other problems, frequently results in varietal mixing; an undifferentiated price structure for different classes of seed; and the lack of a clear GSI policy to guide private and public sector development of the seed industry.

C. Project Purpose and Strategy

The goal of the project is increased income for small farmers producing SRC in the dry and intermediate zones of the country. The increased income, to

result from increased production and profitability of these crops, will be associated with increased rural employment, improved nutrition through increased supply and consumption of protein-rich foods, primarily grain legumes and livestock products, and increased foreign exchange through import substitution and export of agricultural commodities.

The purpose of the project is to strengthen the institutional capability to generate and effectively transfer technologies and seeds required to increase and sustain SFC production on small farms.

To accomplish this purpose, the project will assist in upgrading the capability of the Department of Agriculture to program and carry out sound agro-climatological and farmer-relevant research; effectively transfer new and adapted technologies to farmers; and ensure the supply of quality SFC seed. Private sector efforts will be enlisted in undertaking the latter. The project is an institution building effort, assisting the DOA to strengthen its capability vis a vis subsidiary field crops while maintaining a strong program in rice. This will entail a quantitative and qualitative expansion in staff; strengthened management capability; improved facilities for research, seed production/processing, and staff housing at remote locations; more and better equipment to support SFC activities; increased mobility for DOA staff; and increased funding for SFC-related programs. In a major innovation, the project will introduce and seek to institutionalize an integrated, multi-disciplinary farming systems approach to research and extension. In a departure from traditional Sri Lankan agriculture, support for sustainable SFC production will also be directed at lands, particularly in the Mahaweli area, where up to an estimated 40 percent of the irrigable land is unsuited for paddy production (due largely to soil conditions).

An estimated 909,000 small holder families in the dry and intermediate zones comprise the target group. Of these, approximately 512,000 families (20 percent of Sri Lanka's population) are expected to benefit directly from increased income and employment. Additional benefits over the longer term include improved nutrition for both rural and urban populations through increased consumption of grain legumes and animal protein; increased conservation of the soil and water resource base through the adoption of agro-ecologically improved upland cropping systems and more suitable uses of well-drained lands in the Mahaweli area; and foreign exchange earnings/savings through import substitution and the development of SFC-related agro-industries. The project is also strongly supportive of development equity; agricultural development work in Sri Lanka to date, with its overriding concern for rice production and plantation crop agriculture, has implicitly focused on more favorably endowed areas, to the neglect of large geographic areas and population groups. With assistance from this project, the GSL will devote increased resources to some heretofore neglected areas with their significant populations and largely under-developed, but potentially very high, production potential.

D. Project Elements

1. Strengthened SFC Research Capability: A major objective of the project is to strengthen the DOA's ability to generate, on a sustained basis, the technologies needed to increase production of SFC under both rainfed and

irrigated conditions. To accomplish this, a critical mass of trained research staff will be established within the DOA assigned to seven Regional Research Centers (RRC's) in the dry and intermediate zones and to DOA headquarters in Peradeniya which coordinates and manages the SRC program (see map following page for RRC locations). Each RRC represents a distinct agro-ecological region with some specializing in one or more of the target crops (see Technical Analysis for details).

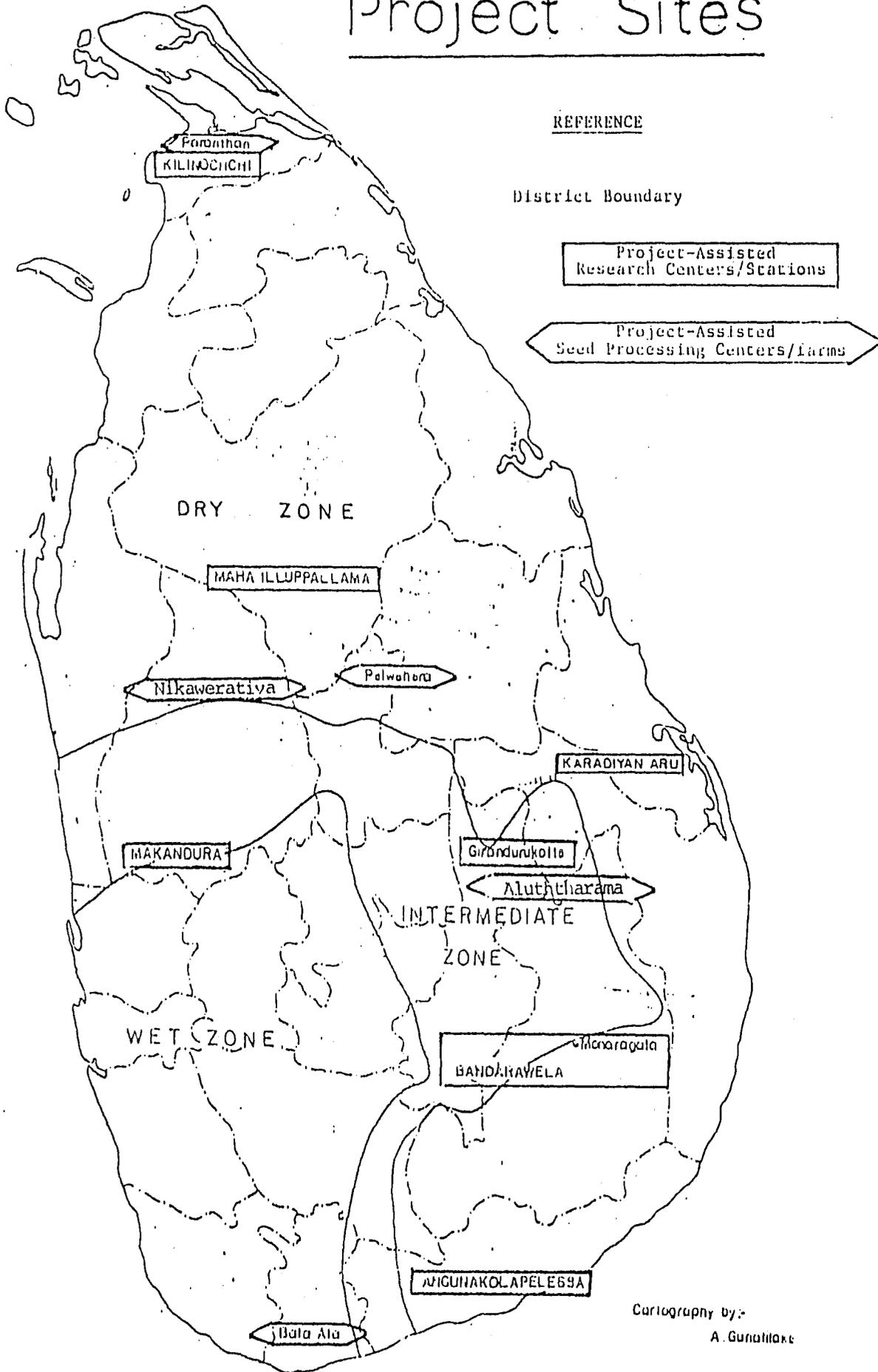
The project will help upgrade research staff capabilities in the SRC through long- and short-term training and provide a new complement of 34 research Officers and research assistants who will also require SRC-specific training. Advanced degree training will be provided in such fields as plant breeding and plant physiology, soil microbiology, plant protection (entomology, weed science, and plant pathology), and food science; short-term training will be funded in such fields as farming systems, plant breeding, pest management, cropping systems, and land and water management. Training will take place at Sri Lanka's Post Graduate Institute of Agriculture (PGIA) at the university of Peradeniya,* U.S. and Asian universities, international research institutes (e.g., IRRI, CIML, ICRISAT, CIMMYT and IITA for specific SRC and cropping systems), and national research programs such as the Indian Agricultural Institute and Thailand's Asia Maize Coordinated Program.

DOA staff capabilities will be strengthened further by a technical assistance program designed to upgrade specific subject areas and introduce new approaches, particularly farming systems. A long-term advisor (48 pm) will assist in institutionalizing a farming systems orientation to research, and, as Chief-of-Party for the technical assistance contractor, assist with overall project management, as well as playing a key role in SRC research programming and monitoring. A cropping systems/research agronomist (24 pm) will develop criteria to strengthen conventional crop management trials under monoculture, assist in the design of trials involving inter-cropping and crop mixtures and the incorporation of farmer practices in adaptive and on-farm trials, and work closely with the national Coordinator for Cropping Systems in expanding upon the on-going rice-based cropping systems work to focus increased attention on SRC in crop sequences, substitutability of SRC on marginal lands used for rice, and other SRC cropping patterns and mixtures in uplands.

A third long-term advisor, a soil and water management specialist (18 pm), will assist in developing criteria for determining appropriate on-farm soil use and water application, as well as introduce management practices found suitable through research investigations on the basis of local agro-ecological conditions. The three advisors will assist in formulating suitable in-country training programs designed to effectively impart new information to extension workers. They will be based at the DOA in Peradeniya in order to facilitate and coordinate work at several RRC's and will travel frequently to research facilities.

* PGIA faculty, curriculum and facilities are being upgraded with aid assistance under the 1978-1986 \$7.5 million Agricultural Education Development Project.

Project Sites



Short-term technical assistance (30 pm) will be provided in, inter alia, agronomy, soil and water management, plant breeding, pest management, and cropping systems. The research programs to be designed and implemented under the project will serve as the basis for the overall DOA program in the target crops and cropping systems. New or modified research activities, however, will be integrated into on-going programs on a gradual basis; e.g., the soil and water management specialist will initially concentrate on work in Mahaweli systems B and C, thereby helping reinforce AID's investment in the former area.

The farming systems approach, similarly, will be introduced gradually beginning with one multi-disciplinary team in the first year of the project located either at Giranurukotte (serving the Mahaweli area) or Maha Illuppallama, the principal dry zone research center. Team members will be drawn from the RRC's (agronomists, extension staff, and an economist) with a rural sociologist or anthropologist provided by the Agrarian Research and Training Institute in Colombo, the University of Peradeniya, or other local source. Working closely with farmers and assisted by the long-term advisors, the team will identify major problems facing farm households in increasing and intensifying stC production and draw up a research agenda based on their findings to guide research and extension work in the region. This process will be expanded to the remaining six research centers during the next three years of the project.

This integrated, multi-disciplinary approach, which represents a major change in agricultural research in Sri Lanka, will be introduced to DOA staff, with contractor assistance, in a project-financed farming systems workshop planned for mid-summer 1985. The workshop will build on the basics of FSR to be presented in an early implementation workshop for key agriculture staff in October 1984 (see Implementation Plan). Planned technical assistance and training will assist in extending the farming systems approach to DOA staff over the life of the project.

Agronomic research will be supported by a continuing series of project-financed social and economic studies. These studies have three basic purposes: (1) to provide programming input that will help ensure the continued relevance of research work and extension, (2) to provide data needed to monitor and evaluate the project; and, (3) to develop the capability to plan and undertake future social and economic research. Socio-economic research will consist of: (a) farm level studies in, for example, farm management, production economics, socio-economic determinants of farming systems and farmers' perceived problems and production potential, and (b) macro-level production and market monitoring and analysis studies. Additional research may be undertaken on specific social or economic problems relevant to stC production identified in the course of project implementation, e.g., rural credit, farmers' organizations, and the influence of farm structure and land ownership and tenure patterns and leasehold arrangements. A senior Sri Lankan sociologist or anthropologist will assist the Division of Agricultural Economics and Projects in the planning, design, implementation and interpretation of specific studies.

Socio-economic research methodologies will include the use of broad-scope, standardized surveys to establish baseline data and track project impact, and more narrowly targeted, problem-specific studies. The survey research will be implemented by field staff based at the RRC's, while more specialized studies will be conducted from headquarters in Peradeniya. ARTI and other local research institutions will participate in the conduct and interpretation of the studies. Aside from the baseline survey work, which will need to be implemented throughout the target area (intermediate and dry zones) in the early stages of the project, farm level social and economic studies will be phased into the regular, on-going DOA program over the life of the project.

Social and economic studies will be managed by the Division of Agricultural Economics and Projects (DAEP), which currently has responsibility for economic research within the DOA, and will be carried out by the DAEP as well as by multidisciplinary teams formed from among the staff of other DOA Divisions and individuals working with the DAEP under the aforementioned inter-institutional relationships. To assist the DAEP with its expanded responsibilities, the project will finance short-term technical assistance (10 pm) in anthropology/sociology to help plan special-focus social science research projects, assist in reviewing research proposals, and give seminars on research methods and analysis in the social sciences as applied to agricultural development. Short-term assistance will also be provided to assist in planning, implementing and updating the baseline survey. A long-term advisor (24 pm) in agricultural economics will assist the DAEP in: (a) organizing and coordinating the new data collection system; (b) carrying out specialized economic studies on, for example, particular marketing problems related to specific crops; (c) participating in farming systems research; and, (d) upgrading technical skills of this relatively new division.

By the end of the project, there will be at least one economist at each of the seven RRC able to participate fully in farming systems research and supervise regional studies sponsored by the Division, and two or three well qualified senior staff in Peradeniya to backstop regional programs, undertake specialized studies, and provide on-the-job training to junior staff. To meet these needs, the project will finance long- and short-term training in such fields as production/farm management, agricultural policy, marketing, credit, and econometrics at PGIA, and in the U.S. and third countries, including the IARCs, and training for ARTI or other social scientists in rural sociology and farming systems research. Short-term training in micro-computer programming will strengthen DAEP's data handling and analysis capabilities. The project will also upgrade DAEP's micro-computer capacity.

To support the DOA's expanded agronomic and socio-economic research program in the StC, the project will help upgrade its research facilities and transportation. Laboratories, screenhouses, store houses, cold storage units, workshops, staff quarters, and one seed husking and drying slab will be constructed or modernized. The project will also finance field, laboratory and office equipment and supplies; books and journal subscriptions; and vehicles. (See Annex B.9 for planned location/utilization of facilities.)

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2. Improved Extension: with assistance under the world Bank-financed Agricultural Extension and Adaptive Research Project (ALEARP), begun in 1977, the DOA has developed basically sound organizational arrangements for technology transfer; established the concept of interaction between farmers and research scientists; and developed some of the required extension infrastructure (staff, facilities and transportation) and operational procedures including monitoring of extension and training personnel performance. However, the system, as might be expected, is focused on rice production and is still new and flawed. Under AID's project, the extension system will be assisted in expanding its capability to cover the SFC and to function within the framework of a farming systems approach to research and extension, building upon the world Bank project which is scheduled to terminate in 1985.

The project will upgrade the capabilities of extension and training staff in the SFC with priority attention to three categories of officers who play a pivotal role in technology transfer: Subject Matter Specialists at the In-service Training Institutes and Agricultural Officers and Subject Matter Officers at the segment (field) level. Effective use of mass media will be strengthened by upgrading the farm broadcasting program and other media such as film and slide shows vis a vis the SFC, involving both the preparation of appropriate materials and their effective use.

Long- and short-term training will be provided in SFC-related extension, agronomy, cropping systems, plant protection, and water management, and in rural sociology and agricultural journalism, and in-country training programs will be developed using the assistance of the long-term research advisors. Short-term technical assistance (26 pm) will be provided in training methodologies and materials preparation and reporting. The project will also finance audio-visual equipment (primarily replacement parts), production of SFC-specific training and extension materials, educational materials for vocational training centers, three vehicles for extension staff based at regional broadcasting units, and quarters for five new Subject Matter Specialists at dry and intermediate zone In-service Training Institutes.

3. Improved Seed Production and Distribution: As with rice, Sri Lanka's success in increasing the production of SFC will depend in large measure on the availability of quality seed of existing and improved varieties. As outlined earlier and elaborated on in the Technical Analysis, the DOA's seed program has major problems which affect all phases from production to distribution and which inhibit use of improved SFC seed. There is thus a clear need to quickly upgrade the system to permit larger volumes of good quality seed to get into the hands of producers. To make increased volumes of quality seed available, the project will provide assistance to both the public and private sectors in developing the infrastructure for sound research, production, processing, storage, quality control and marketing. Specifically, the project will promote: (1) increased production of seed of improved SFC varieties; (2) reduction of the Government's role in seed production to maintenance/production of breeder, foundation and registered classes of seed with a corresponding expansion of the private sector's role in the production of certified seed and its marketing; (3) establishment of a quality control system for production and distribution; (4) improved storage and processing operations through expansion and upgrading of facilities and

equipment; (5) packaging and distribution of seed that better respond to farmers' needs; and (6) establishment of a sound pricing policy under which the farmer assumes the basic cost of seed production and marketing.

Out of 11 regions and 28 DOA farms involved in SFC seed production and processing, the project will upgrade the seed program in five regions and four seed farms as described in the Technical Analysis. The project will also support the DOA's inoculant production program to produce rhizobia for the treatment of legume seed. Training, technical support and monitoring (to ensure maintenance of varietal purity, etc.) will be provided for an expanded private grower program (there were 490 private growers producing SFC seed for the 1983-84 crop year) for which 11 new staff will be hired early in project implementation.

The Seed Certification Service, started in 1979 for rice, will be expanded to cover the SFC under an existing Netherlands Government Project. Certification of foundation and registered classes of seed will begin in late 1984, and of commercial seed in 1985, with grain legumes given first priority.

Initially, some assistance will be given to upgrade the Government's seed marketing system, currently handled by extension staff through the Agrarian Service Centers. However, as SFC production increases and commercial seed becomes less variable in quality and varietal purity, producer demand for commercial seed will rise, gradually making it financially attractive to private entrepreneurs. The project, with technical assistance, will help in identifying production and marketing opportunities in the private sector, and AID's Private Enterprise Promotion Project or PRE funds may be tapped to finance feasibility studies for this new industry and potentially some seed capital and technical assistance for its establishment.

The project is expected to be instrumental in modifying seed program operations by encouraging rationalization of DOA seed operations and lobbying for prompt adoption of a national seed policy (now in draft) which would lay the foundation for an effective seed program including a major role for the private sector.

In terms of specific inputs, the project will finance a long-term (24 mn) seed improvement specialist, with a broad background in private and public seed industry development (production, processing and marketing) in the early stages of the project to provide assistance in implementing the proposed changes, particularly in program management. Short-term TA (30 mn) will be provided in such field as storage, processing, farm management and private industry promotion. Long-term training in seed technology in the U.S. and short-term training in, *inter alia*, farm management, quality control, pest control, processing and marketing will be provided at PGIA and in the U.S. and third countries.

New processing and storage buildings, drying floors, cold storage rooms (including modification of existing structures), limited staff quarters and some remodelling of existing storage facilities will be financed in the five selected regions, and seed processing equipment, tractors, implements, and vehicles provided. New staff will be hired to support and monitor the expanded

private growers program while additional staff needs, e.g., to oversee quality control at processing facilities and manage fumigation at seed farm storage facilities, will be met by reassignment of present staff.

4. Strengthened Management Capability: In Sri Lanka, as in so many developing countries, management and administrative capability lag far behind technical skills. Yet the ability to plan, implement, monitor and modify or restructure development programs is critical to the effective use of limited resources and to achieving maximum impact from development initiatives. To assist the DOA in sound long-term management of its diversification program, the project will fund short-term training for three or four mid- to senior-level officers per year in management/administrative skills. The training will be provided in the U.S. (e.g., USDA's course on managing Agricultural Research), Asian management institutes, and at such in-country training facilities as the Sri Lanka Institute of Development Administration, and may include visits to other Asian agricultural research facilities to observe their organizational arrangements and procedures for effective program management and administration. The long-term advisor in farming systems research must have strong management skills and work to impart effective management principles and methodologies to DOA staff during project implementation. (For specific information on project management arrangements, refer to the Implementation Plan and Administrative Analysis.)

Short-term technical assistance will also be provided to assist the DOA in determining the most cost-effective and programmatically sound organizational arrangements for carrying out its various programs including SFC diversification. This would involve an assessment of the number and location of facilities; optimum ratio and use of research and other professional staff in relation to support staff; budgetary needs; and, an appropriate balance between operational decentralization, on the one hand, and the requirements for effective policy direction and program management and coordination, on the other.

E. End-of-Project Status

At the end of eight years, the integrated program in subsidiary field crops described above is expected to result in the following conditions:

1. Improved SFC varieties and production practices, appropriate to regionally differentiated farming conditions, being identified and disseminated to farmers;
2. Research strategies and priorities being set on the basis of farmer and market needs;
3. Upgraded and rationalized SFC seed production and marketing system in operation meeting a minimum of 10% of annual SFC seed requirements with a growing private sector role in certified seed production and marketing;
4. Increased understanding of SFC cropping patterns and of social and economic factors affecting production reflected in DOA decision making; and
5. Integrated intra-divisional management system for SFC-related in operation.

F. Project Inputs

Summarizing the information provided in Section D., above, major project inputs include long- and short-term training, including in-country training at the Postgraduate Institute of Agriculture; technical assistance; commodities (laboratory, farm and seed processing equipment, vehicles); construction and renovation of facilities (laboratories, seed processing and storage facilities, staff quarters); new staff; operating budget; and funds for evaluation, several project workshops, and economic and social research. A summary input table is provided below.

SUMMARY INPUT TABLE (\$000) AID-financed

Technical Assistance	3,115
138 pm Long-term	1,675
96 pm Short-term	1,440
Training	1,984
Long-term	1,246
Short-term	723
In-country seminars/workshops	15
Commodities	2,079
Vehicles	625
Equipment (field, laboratory, seed processing, audiovisual and data processing)	1,352
Other (e.g., books, journals, educational materials)	102
Construction	732
Social and Economic Studies	200
AID Centrally-managed Projects	140
Evaluation	125
Inflation	2,522
Contingencies	506
	<u>TOTAL</u>
	<u>11,400</u>

GSL-financed

Personnel*	1,539
Technical Assistance Support	122
In-country Training	11
Commodity Support	33
Construction	262
Operations and Maintenance** (vehicle, equipment, facilities)	1,178
Evaluation	7
Inflation	1,851
Contingencies	157
	<u>TOTAL</u>
	<u>5,160</u>

* Includes 88 new staff members to be hired in CYs 1984-87.

** For costs related to the operation and maintenance of facilities, equipment and vehicles financed under the project.

IV. COST ESTIMATE AND FINANCIAL PLAN

A. Introduction

The total project cost is estimated at \$16.6 million, of which AID will provide \$11.4 million (69 percent) through a development grant of \$7.9 million and a development loan of \$3.5 million. The GSL contribution is estimated at roughly \$5.2 million, of which \$3 million will be new recurrent costs (new hire staff, additional DOA operations costs), and another \$0.5 million will be new capital costs (facilities construction and furnishings). The balance will be in-kind contributions, primarily salary costs of DOA personnel to be assigned full or part-time in support of the project.

Major AID-funded inputs include long- and short-term training; technical assistance; commodities (laboratory, farm and seed processing equipment, vehicles); facilities construction and renovation (laboratories, seed processing and storage facilities, staff quarters); and funds for AID/W central project cost-sharing, evaluation, several project workshops, and economic and social research. Financial details are shown in Tables 1 - 3 and Annex B.5.

As indicated in USAID/Sri Lanka's report, "Mission Financing Policy and Procedures," submitted to the Assistant to the Administrator for Management on March 31, 1984, GSL financial controls are generally good. To meet new AID requirements, the Mission plans to contract in the near future for an in-depth assessment of financial management capability of implementing organizations for all active and proposed projects including this project. Table 3 shows proposed implementation and payment procedures for the project. The GSL has actively participated in formulating the project budget and is fully aware of and willing to assume the recurrent cost burden.

B. Costing and Timing of Project Inputs

This eight-year project has FY 1984 and FY 1988 as its first and final years (respectively) of AID funding with disbursements over eight years and nine months (i.e., to the TDD). Implementation is scheduled to begin late and continue into the fourth quarter of FY 1992. The GSL implementing agency will be the Department of Agriculture (DOA) which will receive all project inputs with the exception of limited long- and short-term training for social scientists which may be provided to strengthen GSL institutional capability (e.g., through ARTI or the University of Peradeniya) to provide sustained sociological/anthropological input in support of farming systems work.

1. Technical Assistance: The project provides for 138 pm of long-term and 96 pm of short-term technical assistance. The long-term TA will be concentrated in the initial three years, with the exception of the Chief-of-Party who will continue through at least four full years; short-term TA, as currently projected, will be spread over the first six years of the project. All TA will be provided through a single, direct AID institutional contract. Total estimated cost is \$4.1 million, using 1984 base costs of \$12,000 and \$15,000 per person month for long- and short-term TA, respectively, inflated at an annually compounded rate of 10 percent over the LOP. Included in the contract is funding for fuel costs for project vehicles used by long-term TA.

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The DOA's TA support costs are based on average figures, derived from experience with former projects, of \$200/month for office space and \$320/month for supplies and personnel support (secretarial/clerical, drivers) per consultant.

2. Training: Both long and short-term training, in the U.S and third countries, are planned: Fifty three master's degrees and eight Ph.D.s comprise the planned long-term training, of which a minimum of 25 percent (estimated 400 p.m.) will be at PGIA to be funded by the GSL. Of the total, 21 master's and 6 Ph.D.s will be, at least partially, at U.S. universities, with the balance in other Asian countries. Long-term training budgets are based on 42 months for completion of Ph.D. and 24 months for a master's degree, with 1984 base costs for overseas training (including tuition, fees, living allowance and air fare) of \$1,800/month for U.S. and \$400/month for third countries, both inflated at an annually compounded rate of 10 percent. Base (1984) costs for academic training at PGIA are \$50 per term (four months), for tuition and fees.

Short-term training is projected at 71 person months in the U.S. and 482 person months in third countries. Budgets are based on 1984 monthly costs (including transportation, fees and per diem) of \$3,400 and \$1,000 for the U.S. and third countries, respectively, inflated at an annually compounded rate of 10 percent. All project training will be managed and funded through the technical assistance contract, either directly or by means of a sub-contract.

Funding is also included for three in-country workshops, one in late CY 1984, a second in CY 1985, and a third in CY 1989. For these, AID will fund associated dollar costs (materials, resource personnel) and, for the initial workshop, a share of local costs.

3. Commodities: AID-funded commodity purchases are estimated at \$2.4 million, of which \$0.15 million will be local procurement. Off-shore procurement will be in three major installments (1985, 1986 and 1988) and, with the exception of vehicles being procured from Code 935 countries, will be handled through a host country contract with a U.S. Procurement Services Agent. Local procurement will be by the DOA on a reimbursement basis. Cost estimates are based on a compounded annual inflation rate of 10 percent.

GSL commodity costs include clearing, warehousing, inventory and inland transport, based on an average cost of \$320/unit for "large" items (e.g., vehicles).

4. Construction: AID's share of estimated construction costs total \$1.03 million, all of which will be local currency expenditure; costs are calculated on a 1984 unit cost basis inflated at a compounded annual rate of 10 percent. Construction financing will be by Fixed Amount Reimbursement (FAR), with AID reimbursing 75 percent of agreed-upon costs. Construction is scheduled for the years 1985-89, with the major share in 1987. (Furnishings are a GSL contribution and are not included in this calculations.)

GSL facilities costs include 25 percent of the agreed upon total construction costs (including utilities connections, access roads, etc.) plus furnishings.

TABLE 1

SUMMARY COST ESTIMATE AND FINANCIAL PLAN

(\$000)

	AID GRANT FUNDS		AID LOAN FUNDS		GSL FUNDS		TOTAL		TOTAL PROJECT COSTS	
	FX	LC	FX	LC	FX	LC	FX	LC	AMOUNT	% OF TOTALS
TECHNICAL ASSISTANCE	3,115.4	-	-	-	-	121.6	3,115.4	121.6	3,237.0	19.6
TRAINING	1,969.4	15.0	-	-	-	11.0	1,969.4	26.0	1,995.4	12.0
COMMODITIES	-	-	1,949.8	129.1	-	32.8	1,949.8	161.9	2,111.7	12.8
FACILITIES	-	-	-	731.7	-	262.3	-	994.0	994.0	6.0
PERSONNEL	-	-	-	-	-	1,538.9	-	1,538.9	1,538.9	9.3
OPERATIONS & MAINTENANCE	-	-	-	-	-	1,177.6	-	1,177.6	1,177.6	7.1
EVALUATION	125.0	-	-	-	-	6.9	125.0	6.9	131.9	.8
SOCIAL & ECONOMIC RESEARCH	-	200.0	-	-	-	-	-	200.0	200.0	1.2
CENTRAL PROJECT COST-SHARING	140.0	-	-	-	-	-	140.0	-	140.0	.8
SUB-TOTAL	5,349.8	215.0	1,949.8	860.8	-	3,151.1	7,299.6	4,226.9	11,526.5	69.6
CONTINGENCY	321.0	12.9	117.0	51.6	-	157.5	438.0	222.0	660.0	4.0
INFLATION	1,865.1	99.2	297.3	260.5	-	1,851.4	2,162.4	2,211.1	4,373.5	26.4
TOTAL PROJECT COSTS	7,535.9	327.1	2,364.1	1,172.9	-	5,160.0	9,900.0	6,660.0	16,560.0	100.0
	=====	=====	=====	=====	==	=====	=====	=====	=====	=====

5. Evaluation: Evaluations are scheduled in 1987, 1988, and 1992; they will be implemented through institutional and/or personal services contracts funded on a direct pay basis. Total costs are estimated at \$217,000, based on a 1984 unit cost of \$15,000/person month inflated at a compounded annual rate of 10 percent. The GSL's contribution to evaluation are in-kind personnel costs.

6. Social and Economic Research: Specific project-related social and economic studies are planned throughout the life-of-project. Estimated total cost (including inflation) is \$286,000, all in local currency. Mutually agreed-upon studies will be implemented through local host country contracts, with direct reimbursement by AID.

7. Central Project Cost Sharing: A total of \$208,600 (including inflation) is reserved for participation in relevant AID/W-managed projects throughout the LOP, with payment by means of intra-agency transfer.

8. DOA personnel costs (salaries and allowances) are based on a projection of total staff increase, both technical and support, of 88, beginning in late 1985, and calculated at standard GSL rates which include annual increases apart from inflation. The inflated DOA personnel cost totals \$2,425,200.

9. Vehicle/equipment operations and maintenance are based on a 1984 monthly cost of \$140 for passenger vehicles, \$120 for utility vehicles, and \$167 for tractors.

10. Building utilities and maintenance figures are based on a 1984 cost of \$400/year per structure.

C. GSL Budget Analysis

DOA and total MADR budgets for the years 1982-84 are shown below (\$'000 equivalents):

	<u>Table 2</u>		
	1982	1983	1984
	(Actual)	(Estimated)	(Estimated)
<hr/>			
Recurrent Budget			
DOA	4,375	5,800	6,160
MADR	9,215	13,930	13,270
Capital Budget			
DOA	1,300	3,190	3,280
MADR	17,545	25,135	32,000
Total			
DOA	5,675	8,990	9,440
MADR	26,760	39,070	47,670
<hr/>			

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The 1985 GSL budget, now under preparation, is expected to reflect an overall maintenance of 1984 levels in the face of significant general budget cuts. The additive GSL recurrent budget for this project is shown in Annex B.5, Table 4. For 1985, this amounts to \$60,000, or 1.0 percent, of the DOA's 1984 recurrent cost budget. By the end of the project, new annual recurrent costs will amount to approximately \$292,000, or 4.7 percent, of 1984 recurrent costs. The DOA does not anticipate problems in obtaining the required recurrent budget.

Table 3
Proposed Payment Procedures

Item	Method of Implementation	Method of Finance	Approximate Amount (\$' 000)
Technical Assistance	Direct Institutional Contract	Direct Pay	4,100
Training	(Through TA Contract)	-	-
Construction	HC Construction Contract	FAR	947
	HC Contracts With A & E Firm	Direct L/Comm.	86
Commodities: Foreign Exchange	PSA	Direct L/Comm.	2,250
Local Currency	HC Procurement	HC Reimbursement	150
Evaluation	Direct Institutional Contract, or PSC	Direct Pay	217
Social/economic Research	HC contract	HC Reimbursement or Direct L/Comm.	286
Central Project Cost-Sharing	Direct Pay	Intra-Agency Transfer	209

V. IMPLEMENTATION PLAN

A. Procedures

The Department of Agriculture, Ministry of Agricultural Development and Research (MADR), will implement the project. Direction will be exercised by a Coordinating Committee chaired by the Secretary, MADR, which will include the Director of Agriculture, the Project Manager, the USAID Project Officer, and the contractor Chief-of-Party, plus representatives of other GSL institutions as appropriate. Day-to-day management (planning, coordinating, monitoring, and accounting) will be the responsibility of a Project Management Unit (PMU) headed by a Sri Lankan Project Manager appointed by the DA and supported by administrative and programming staff. The Chief-of-Party for the technical assistance team will work directly with the Project Management Unit in overall project administration.

The Project Manager and support staff will be nominated prior to project authorization, to take advantage of relevant short-term training, particularly in farming systems. A pre-implementation workshop, including key personnel from both USAID and the GSL, will be held in October 1984 to help ensure common understanding of project objectives and implementation procedures.

Because the DOA has no in-house sociological or anthropological expertise at present, services of social scientists to work with RRC-based cropping system teams, and to assist in the design and monitoring of special project studies with a sociological component, will be obtained from the Agrarian Research and Training Institute, University of Peradeniya or other local sources under a DOA memorandum of understanding or contract.

1. Technical Assistance and Training

Technical assistance and training will be implemented by a contractor under a direct AID contract financed through a Mission-issued Direct Letter of Commitment. The Department of Agriculture will be actively involved in preparation of the Request for Proposals (RFP), in evaluation of proposals, and selection of the contractor, and will be consulted as necessary during contract negotiations. The project will finance DOA participation, if required, in site visits in connection with contractor selection. The Area Contracting Officer (ACO) will also be actively involved in the contracting process. The RFP will be released as soon as possible after signature of the Project Agreement.

The principal contractor is expected to be a private firm, which may then sub-contract as necessary with other firms, universities, IARCs, etc. The prime contractor will be responsible for provision of all technical assistance, for developing and updating the project training plan (in conjunction with the DOA), and for programming and monitoring of long- and short-term training. Both the technical assistance and training are expected to continue throughout the eight-year life-of-project, with most long-term technical assistance to be provided during the first four years. The COP is initially programmed for four years, with the option of extension pending the outcome of the mid-project evaluation in 1988.

The contractor will be provided office space, equipment and supplies by the Department of Agriculture. Certain items, such as a typewriter, photocopying machine, and other small items will be financed with AID project funds. Limited funds will also be included in the contract for local, small-item procurement directly by the contractor.

Five DOA vehicles financed by the project will be reserved for use by technical assistance personnel for work-related transportation. Support staff for long- and short-term TA will be provided by the DOA with the exception of an administrative assistant and secretary for the COP, who will be employed locally by the contractor. The contract will include funds for housing, furnishings, and utilities, and for operations and maintenance costs for vehicles assigned for use by long-term contract personnel. The contractor will be expected to conclude a local logistical support sub-contract to handle such tasks as location of housing and furnishings in Peradeniya, utilities arrangements, and personal logistics (e.g., expediting port clearances for HHE and POV, visas, etc.), the terms and conditions of which will be determined by the prime contractor subject to AID approval.

Training will be both long- and short-term. Long-term training will be at both U.S and Asian (Geographic code 901) universities, in conjunction, to the extent possible, with the Post-Graduate Institute of Agriculture, University of Peradeniya. Long-term training participants will be selected through their respective Divisions, with the PMU (and contractor) responsible for arranging their placement and monitoring performance.

Approximately 25 percent of total long-term training will be completed at the PGIA; most long-term trainees will be expected to complete at least one term at PGIA in the course of their academic programs, with the goal of awarding half of the master's degrees (M.Phil.) from PGIA, subject to the transferability of credits. It may be advisable, for instance, depending on the program, to provide the basic coursework at an institution outside of the country while arranging for thesis work and granting of the degree under PGIA auspices.

While it is intended to do as much project training at PGIA as possible, the Institute is still relatively new, established just nine years ago. Its teaching staff is drawn from the Faculty of Agriculture, University of Peradeniya. Under AID's Agricultural Education Development Project, 38 faculty are being trained in the U.S. to advanced degree levels; of these, 11 have returned with the balance expected to complete their degrees between mid - 1984 and September 1986. Thus, PGIA will not be fully able to handle a major increase in student population for several years (particularly at the Ph.D. level) nor, even then, will it have competency in all fields, e.g., seed technology, water management, required for the project.

Preference in external academic training will be given to institutions in the region because of the greater relevance of the training to conditions in Sri Lanka. All trainees will be bonded and will be expected to return to work for the DOA or other parent organization, in the case of social scientists, upon receipt of their degrees. Detailed training plans will be prepared and updated annually. All long-term trainees will begin their degree studies by the end of CY 1988, with roughly equal numbers beginning their studies each year commencing in 1985.

Short-term training will continue throughout the IOP, a major share of which will be undertaken at International Agriculture Research Centers (e.g., ICRISAT, IRRI) in farming systems and specific technical areas, including rice and rice-based cropping systems. Appropriate programs will be jointly identified by the PMU and participating DOA divisions. Participants will be selected by their respective divisions, with placement, monitoring and funding handled by the PMU and contractor. (See Training Plan, Annex B.8, for details.)

2 Commodities

Commodities will be procured directly by the Department of Agriculture, either acting on its own behalf or through a U.S. Procurement Services Agent (PSA) for most off-shore procurement. General categories of commodities to be procured by the PSA include seed processing equipment, tractors and farm machinery, scientific and laboratory equipment, and data and word processing equipment. The major direct DOA off-shore procurement will be vehicles (sedans, utility vehicles, motorcycles); limited local procurement, confined largely to office equipment and pallets for seed storage, is also contemplated. The DOA will have title to all commodities, with the exception of household furnishings and appliances for technical assistance personnel, title to which shall be retained by USAID for use in other, mutually approved development projects. RCMO/Bangkok and the TA contractor will be consulted and actively involved in all major procurement actions.

Three major procurement actions are contemplated: One, in 1985, for vehicles, tractors and farm equipment, scientific and laboratory equipment, and data and word processing equipment; a second, for seed processing equipment (exact timing contingent on facilities completion, but tentatively scheduled for 1987); and a third, consisting primarily of replacement equipment, in 1988. Because the PSA fees will be under \$100,000, informal contracting procedures will be followed. (Full procurement details are included in the Commodity Procurement Plan, Annex B.9).

Authorized source and origin for project commodities is Code 941 and Sri Lanka. Waivers are required to permit vehicle procurement from Code 935 countries, and for local host country procurement pursuant to USAID/Sri Lanka regulations). A source/origin vehicle procurement waiver request is included at Annex A.6

3. Construction

Seed processing facilities, workshops, laboratories, stores, and quarters are the principal facilities to be constructed under the project, together with some remodelling or renovation of existing storage facilities. Construction will be funded through Fixed Amount Reimbursement (FAR), with AID reimbursing 75 percent of pre-agreed costs. Standardized plans and specifications exist for most structures to be constructed. Finalization of all plans and specifications and construction supervision, will be undertaken by a local A&I firm, competitively selected, under contract to the DOA. Construction will be by local private firms, competitively selected, with each firm responsible for all construction work at a single site (12 sites in all). USAID engineers have reviewed and approved building plans and have made, or will make, site visits to review and approve site plans prior to contracting.

4. Evaluation

Evaluation, as described in the Evaluation Plan, will be undertaken under a direct AID contract, both for local and expatriate technical assistance. Terms of reference for evaluations will be jointly developed and approved by the DOA and USAID.

5. Seminars and Workshops

- a) A project-funded implementation workshop, described in the Project Description, is planned for October 1984. AID will directly fund all associated dollar costs, and a share of local costs, if necessary.
- b) A Farming Systems Research Workshop is tentatively planned for July/August 1985, possibly jointly funded by the project, the AID Farming Systems Support project (936-4099), and the proposed CIDA-funded Dryland Systems Project. Implementation details will await input from the prime contractor.

6. Social and Economic Studies

The studies will be designed and monitored by a social science review sub-committee, and implemented through local host country contracts, subject to USAID review and approval. The sub-committee will be established by the Project Coordinating Committee. It will be chaired by the Deputy Director for Agricultural Economics and Projects and will include an additional agricultural economist from that Division, two other persons from the DOA (including at least one representative from the Research Division), one anthropologist or sociologist working with the DAEP, and a representative from USAID. Duties of the sub-committee will be to review, and recommend for funding, proposals for project-related research involving social science methods or analyses, review past efforts of this nature, and recommend new work.

7. Utilization of AID/W-managed Projects

Utilization of, and experience with, AID/W-managed projects will be reviewed and plans for the following year formulated in the course of each annual review (March-April).

B. Implementation Schedule1984

- July - Project authorized
- August 15 - Project Agreement signed
- August 31 - PIL # 1 issued
- October 1 - Request for proposals for TA/training contract issued
- October 1 - RFP issued for engineering design and supervision
- October 1 - Call for tenders for COP vehicle
- October 1 - Project Implementation Workshop
- November - PSA solicitation
- November 15 - Initial conditions precedent met
- November 30 - Receive proposals for engineering design and supervision from A&E firms
- November 30 - Receive bids for vehicle for COP

1985

- January 4 - Order vehicle for COP and office equipment for PMU; issue engineering design and supervision contract
- January 30 - Evaluation of TA proposals completed
- February 1-15 - TA contract assessment trip to U.S.(if required)
- February 15 - Local logistics support subcontract signed by contractor
- February 28 - PSA selected
- March - Design of baseline survey (with assistance of short-term TA)
- March - Chief-of-Party arrives (possibly on TDY in conjunction with negotiations)
- March 31 - TA contract signed
- April - Finalize 1986 project budget
- May - Initial commodity order forwarded to PSA
- May/June - Participants selected to begin long-term training in September 1985
- June - Approval of plans, specifications, and FAR prices for 1986 construction
- June/July - In-country workshop on Farming Systems Research
- July - 1985/86 Project Technical Work Plan prepared
- July - Baseline survey begins
- August 1 - Call for tender for vehicles
- September - Other long-term TA advisors arrive
- October 1 - Call for tenders for 1986 construction
- October - Baseline survey completed

1986

- January - Issue construction tender awards
- March - First annual project review
- March - Initial commodity order received
- April - Finalize 1987 budget
- July - Change in USAID Project Officer
- July - Preparation of 1986/87 Project Technical Work Plan
- October 1 - Call for tenders for 1987 construction

1987

- January - Second commodity order placed
- January - Issue construction tender awards
- March/April - First project (process) evaluation
(replaces annual project review)
- April - Finalize 1988 budget
- July - Preparation of 1987/88 Project Technical Work Plan
- November - Arrival of commodities

1988

- January - Third commodity order placed
- March - Annual project review
- April - Finalize 1989 budget
- July - Preparation of 1988/89 Project Technical Work Plan
- September - Second project evaluation
- November - Arrival of commodities

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- July - End-of-Project Impact Evaluation
- July 30 - Project Assistance Completion Date (PACD)

1993

- April 30 - Terminal Disbursement Date

VI. MONITORING PLAN

Primary USAID responsibility for monitoring the project will lie with the Project Officer, in USAID/Sri Lanka's Office of Agriculture and Rural Development (ARD). The present Project Officer is an agricultural economist with experience in agricultural research and tropical agriculture, who is scheduled to remain in Sri Lanka throughout the first two years of project implementation. The Project Officer will be assisted by a FSN Direct Hire extension agronomist.*

In carrying out his responsibilities, the Project Officer will be assisted by a USAID Project Committee, established in April 1983, composed of a financial analyst, engineer, economist, project development officer, and the Regional Legal Advisor, who is based in Colombo. All members of the Project Committee have been closely involved in project design and PP preparation. In addition, the Project Officer will draw, as needed, on the services of the Regional Commodity Management Officer (Bangkok) and the Area Contracting Officer (New Delhi), both of whom have been consulted on implementation arrangements for the project.

The Project Officer will be one of approximately 10 members of the GSL Coordinating Committee (for composition see Implementation Plan) which will meet at least once a quarter to review project progress and problems. Other monitoring mechanisms include site visits by the Project Officer, engineer and other USAID staff; review of quarterly USAID implementation status reports; regular Mission portfolio review meetings; quarterly contractor reports; GSL reports (e.g., semi-annual commodity receipt and utilization, shipping, construction progress); annual reviews; the 1987 and 1988 evaluations; and audit reports.

Annual project reviews are planned for February or March of each year (with the exception of 1987 when the review will be replaced by the first project evaluation). The reviews will assess progress in implementing the project (focusing on inputs), identify and resolve constraints to the extent possible, and provide the bases for GSL budget preparation for the following year, and for preparation of annual project technical work plans each July (which will cover the crop year beginning with Maha season each September). Participants in the annual review will include DOA personnel (Peradeniya and field staff), USAID staff, and contractor personnel including at least one home office representative. The Project Officer will promote and facilitate regular contacts with staff from other donor-funded SFC projects (e.g., CIDA, ADB) to help ensure a high level of complementarity and mutual support, and to share project findings.

Early in project implementation the USAID Project Committee will identify areas particularly important to project success for special monitoring, e.g., progress in applying the farming systems approach to research, GSL pricing and import policies, market development, effective utilization of returned participants, and adequacy of incentives for DOA personnel to serve at remote research stations.

 * ARD at present has a professional staff of three USDH and three Sri Lankans FSN DH (to be expanded in mid-1984). Two agriculture projects will terminate in June 1984, at which time ARD will have two major projects in implementation in addition to this new project. The design of one new project is planned in FY 1985.

VII. PROJECT ANALYSES

A. TECHNICAL ANALYSIS

1. Background

Because of its economic and dietary importance in Sri Lanka (nearly 30 percent of agriculture's contribution to GDP, and 75 percent of total cereal consumption), rice has been receiving a major share of the agricultural research budget over the past several decades. Extension work has concentrated on rice production, which has been encouraged through incentive prices administered through such public agencies as the Paddy Marketing Board. About 36 percent of fertilizer use between 1973 and 1980 was for rice production. No other agricultural product received such relative attention and resources, except perhaps the major export crops - tea, rubber and coconut. This concerted effort on rice is paying off. Since the 1960's, rice production has more than doubled. Much of this improvement in aggregate production has come from increased yield per unit of land, which has increased by more than 50 percent over the past ten years (see Table a, Annex B.6). As a result, rice imports have been reduced drastically, from 530,000 metric tons in 1960 to 112,000 in 1982. No rice imports are presently planned in 1984.

If improvements in rice production and yield continue at the current pace, the country will be fully self-sufficient in rice in a matter of years, necessitating that the GSL initiate action now as the potential for over-production becomes a reality. A recently completed study of the Sri Lanka rice industry states:

"Sri Lanka is a high-cost producer of non-exportable quality rice. To develop varieties that are of export grade will take many years, and there is not an assured market for farmers to grow this rice, unless they are heavily subsidized. Even if the varieties are forthcoming, the milling industry has to be vastly improved, and major investments will be needed for an export-oriented infrastructure.... Production should not exceed self-sufficiency levels, and this balance can be maintained by both expanding domestic consumption and by reducing the area under rice.... If production still gets ahead of consumption growth, well-drained irrigated land under paddy should be allowed to move to other more remunerative crops."*

The imminence of self-sufficiency in rice has increasingly helped to focus attention on the SFC. There are also other important issues helping to push the SFC into the forefront of consideration:

(a) Nutritional standards have declined over the past years, highlighting the need for improved balanced nutrient intake, especially protein and calorie, in which the SFC rate highly.

(b) SFC production is becoming increasingly commercialized (generally over 80 percent of total production is marketed); the SFC are an important source of income for many districts in the dry and intermediate zones of the country. A degree of regional specialization is manifesting itself, as shown in the maps, Annex B.6. Attention paid to these crops will help the absolute and relative income levels of SFC-producing families.

*See Ronco Consulting Corp., "Sri Lankan Rice Industry: Export Potential for Sri Lankan Rice, and Processing of Rice and Rice By-Products-- Prospects and Possibilities," Washington, D.C., November 1983.

(c) Traditionally, production of the SFC has been carried on predominantly in the dry zone upland areas through the system of shifting cultivation known as "chena." With increasing population pressures and government restrictions on the expansion of chena, true restorative fallow periods are a thing of the past. Resulting soil fertility and pest/disease control problems limit the potential for yield increases in the absence of major technological advances. The country is also concerned about its dwindling forest reserves and associated degradation of the country's localized ecological systems due to expanding chena cultivation. The economic cost of this process is worsened by the fact that forest resources that can be used for firewood, charcoal, or lumber are wasted through burning as land is brought into chena cultivation. Thus, stabilization of upland agriculture is a major policy concern of the GSL.

(d) The SFC are relatively well adapted to the moisture stress conditions that often prevail in the dry zone, and some of them act to improve soil fertility and soil structure through use in rotations.

(e) Over the past six years, Sri Lanka has annually imported over 13,000 metric tons of pulses worth \$6.5 million which could be domestically produced, saving some foreign exchange while generating increased rural employment. Exports of certain SFC (especially sesame) amounted to \$11.2 million in 1982.

(f) The potential to increase the output of SFC is quite high, as shown in the table below. The wide gap between experiment station and farmer yields is a rough indication of the potential that now exists.

Average yield of SFC (Kg/acre/season)

1 Crop	2 1960-1964	3 1965-1970	4 1971-1976	5 1977-1982	6 Experimental Maha	7 Results Yala
Sesame	193	203	203	263	800*	457
Soybean	-	-	371	591	977	966
G.nut	202	149	396	438	1007	1076
Cowpea	205	200	293	341	793	461
G.gram	243	237	244	329	635	550
Maize	310	313	308	471	1235	N/A

*Best Sri Lankan yields from Agroskills Marketing Report Vol.1., p.62. Cols. 2 to 5 are compiled from Census and Statistics and DOA data. Cols. 6 and 7 are from annual reports from the Maha Illuppallama and Karadiyan Aru RRC's and from project design team discussions with research personnel during field trips.

The principal SFC in Sri Lanka may be grouped roughly as follows:

- Coarse grains, consisting of maize, the millets and sorghum;
- Pulses (grain legumes), including cowpea, green gram and black gram;
- Oil seeds, such as sesame, soybean, groundnut* and castorbean;
- High cash value crops such as chillies, onions and potatoes; and
- Manioc (cassava), an important crop, both from sheer size of acreage and its role as an "insurance" food.

Area and production for the principal SFC, from 1971 through 1982, are shown in Table b, Annex B.6. All of the SFC obviously cannot be given equal attention. In general, the criteria used for selecting from among the crops should reflect the degree to which they contribute towards GSL and project goals and objectives, primarily increased income and rural employment. Other issues should also be addressed, sometime indirectly. For example, improved nutritional balance for households may come about, in part, either by some of these households directly growing more of the crops essential for balanced foods, or else through higher incomes generated by growing other crops which would enable them to afford an improved diet.

In terms of crop emphasis, primary attention, at least in the initial phase of the project, will be given to maize within the coarse grains; cowpea, and green and black gram within the grain legumes; and, sesame. Maize is important as a high calorie food crop and as a feed grain, and is being imported to meet growing requirements. Cowpea, and green and black gram are important, protein-rich dietary staples in short supply. Sesame, grown largely on uplands during the Yala, is an important export crop.

At each review and evaluation of the project, the SFC will be assessed in respect to their importance as food, feed and export crops. Criteria in these reviews will include potential economic impact at the macro-level, such as industrial and/or export potential, and policy constraints related to imports and pricing or commodity floor price support, import substitution, and livestock development. Factors at the micro-level will also be considered, such as effect on small farmer income, employment, improved family nutrition, diversion of marginal lands, and social or economic equity within agro-ecological zones. For example, pigeon peas could become important for home consumption and the local market if germplasm is found to have resistance to pod borer. Soybean may become more important on a national level as processed products achieve widespread prominence, or soybean oil is accepted as a substitute for coconut. Groundnut may attain importance for export when certain traits such as kernel weight and skin color have been modified. Lentils, which are presently imported, and chillies and onions, which are highly remunerative cash crops with import substitution and export potential, may also warrant increased emphasis. Thus, the allocation of funds, resources, and personnel will depend to a degree on the emphasis which individual SFC should receive and will be subject to revision over time.

The problems being addressed by this project are low productivity in the production of SFC, and the inadequate institutional capability in the DOA to effectively address the productivity question. The proposed solution

*In many cases, soybean and groundnut are listed among pulses.

calls for an integrated program of research, seed improvement, and extension, employing a farming systems methodology in conjunction with a program of technical assistance, training, infrastructure development (concessities and facilities), and improved management.

Based on prevailing technology and research from Sri Lanka and other countries, it is clear that measurable increases in SFC production can be achieved with relatively small changes in farming practices, e.g., row planting versus broadcast sowing to facilitate weed control; timely planting to reduce incidence of diseases and insect damage, optimize use of soil moisture, and assure harvest during the dry season; appropriate methods and timing of fertilizer application; planting on the contour for soil conservation; and, use of compatible and productive crop mixtures and sequences. Use of improved seed of varieties suitable to particular agro-climatological regions can also notably increase yields.

Experience, both in Sri Lanka and other countries, also clearly demonstrates that the institutional deficiencies can be effectively addressed through a well-designed and implemented program of professional development, infrastructural improvement and technical assistance. The recently completed Rice Research Project (383-0040), which contributed significantly to a dramatic increase in production through such an approach, building on a basically sound research structure and program within the DOA, provides a relevant model for this project.

2. SFC Research

Responsibility for crop research resides with the Deputy Director of Agriculture for Research (DD/R), located in Peradeniya. Research is decentralized, distributed by crop commodities among nine Regional Research Centers (RRC's), located in distinct and clearly delineated agro-ecological regions comprising three broad agro-climatic zones, namely, dry, intermediate, and wet (see map, in Project Description, Section III); most SFC research is undertaken through the seven RRC's covering the dry and intermediate zones. Under the jurisdiction of each of the RRC's are several Agricultural Research Stations (ARS') and Adaptive Research Farm (ARF's).

Research, e.g., plant breeding, agronomic practices, pest management, etc., is widely focused on regional target crops at the RRC's with complementing and substantiating trials being conducted at the ARS' and ARF's. The type of research is largely determined by decisions of the Regional Technical Working Groups (RTWG's), with the approval of the DD/R and Director of Agriculture, consistent with national research priorities. The RTWG's are composed of staff from the Divisions of Research, Extension, and Education and Training who meet semi-annually in each region in advance of the two growing seasons to review the past season's activities, progress of special programs, pertinent problems that have arisen and possible avenues of attack, and areas in which emphases in research, extension and in-service training are needed. The RTWG meetings have brought the three entities together and provide a good forum for exchange of information and ideas, as well as discussion of mutual problems. Their deliberations are fully documented and reviewed by the DD/R before priorities are set for seasonal research.

Along with the RTWG systems of research programming and review is a system of national coordinated trials. National coordinators based at the various RRC's exist for all crops under consideration, and for cropping systems research. The coordinators participate in the RTWG, and have

responsibility for planning, overseeing and reviewing the national coordination program, and for maintaining contacts with relevant International Agriculture Research Centers (IARC's).

Following are the RRC's included in this project and a brief note of their primary activities and research areas, as currently identified, to receive project emphasis.

Maha Illuppallama: This is the principal dry zone station. Research on grain legumes, coarse grains, agro-industrial crops, and pasture agronomy is emphasized. Rainfed rice is of importance along with breeding of cowpea, green gram, soybean, and maize. This station coordinates rice-based cropping systems research, and integrates grain legume and coarse grain research through the respective coordinators. It is also the main base for backstopping the CIDA-supported Dry Zone Agricultural Research Project.

Within the scope of this project major emphasis will be given to varietal development of cowpea, green gram and maize, along with other components of production technology, and rice/other crop sequences.

Killinochchi: Grain legumes, finger millet breeding, oil crops and condiments (chilli and onion) take precedence, along with limited breeding of black gram. Water management, varietal testing, and plant protection studies of these crops are also carried out, and will be supported by this project.

Karadian Aru: Grain legumes and condiments (chilli and onion) take precedence, along with limited work on groundnut and maize varietal testing. At this station, the production technology of the above crops will be strengthened, with special focus on maize/other crop mixtures.

Angunakolapellessa: Oil seeds, coarse grains, groundnut, and cotton take precedence, with limited breeding of sesame. Attention will be given to varietal selection of sesame and testing of grain legumes and coarse grains, along with cropping systems as related to agriculture in the region.

Makandura: Cropping intensities in rainfed rice lands, crop diversification patterns in rainfed coconut upland, increased grain legume production, and cropping systems take precedence, with limited work on groundnut. This is a new station, with major infrastructural development needs. The components of cropping systems will be strongly supported, especially in the grain legumes.

Grandurukotte: This is the RRC for System B of the Mahaweli Program, primarily for study of water management and irrigated cropping patterns in the two systems. This station is in the early stages of development and receives support from the Mahaweli Authority. Research, however, is carried out by DOA personnel. A major focus, with assistance for this project, will be on substitutability of SRC for rice on marginal lands, SRC sequences, and pasture agronomy. The latter is of particular significance because of the potential for introduction of livestock as a component of farming systems research. Work undertaken at the station will be closely coordinated with the Aralanganwila station in System B which will be directly supported by the planned AID-assisted Mahaweli Agriculture and Rural Development Project, No.383-0086.

Bandarawela (and Moneragala Research Station): Bandarawela RRC itself, located in the wet zone, does little work directly related to the SFC and, therefore, is not of direct concern to this project. However, the region includes Moneragala District, a large maize-growing region. Thus, major attention will be given to maize cropping patterns and varietal testing, along with limited work on groundnut and grain legumes, at the Moneragala station.

Economic research is carried out by the Agricultural Economics and Project Division (DAEP) of the LOA. Its duties include agro-economic data collection and analysis, and monitoring and evaluation of programs and projects. The DAEP has a permanent field staff consisting of one Agricultural Economist and one Economic Assistant based at each RRC to implement the regular data collection program and undertake economic analyses of regional programs and activities. Its central staff identifies and defines research priorities, designs specific studies, and undertakes most detailed analytic work. Constraints on the effectiveness of the DAEP include lack of trained personnel, inadequate data processing capability, lack of mobility in the field, and inadequate resources to carry out a full range of needed research. In addition, the DAEP has no in-house expertise in anthropology or sociology as applied to the solution of social, organizational or institutional problems in agricultural development.

The overall status of the SFC research program can be described as nascent. Because the SFC have been overshadowed in the drive for rice self-sufficiency, there has been little public recognition of efforts in the SFC. While some capable researchers are at work, the research has tended to be disjointed, ad hoc, without concerted direction or coordination, and with limited resources including laboratory facilities, equipment, transportation, and staff in specialized disciplines. Improved management of the overall SFC program is a major need. And while the RIWG model theoretically promotes a program two-way flow of information between researchers and farmers via extension and training, in actuality there is relatively little direct farmer participation. On-farm trials are commonly carried out according to regularized on-station designs and often neither represent nor reflect farmer conditions. In addition, market considerations appear to play a minor role in research programming. Thus, current on-station and on-farm research do not fully reflect farm unit needs or market realities.

The strategy to increase SFC production is to provide improved varieties having high yield potential, which are responsive to physical inputs, yet show yield stability under different agro-ecological conditions and low-risk farmer situations. However, crop culture and management studies will venture beyond such conventional trials as plant densities, methods and timing of planting and response to fertilizer and stress conditions, and place increased emphasis on mixed cropping and inter-cropping. Management practices for the new varieties will be determined under regulated, on-station experiments, and on-farm verification trials.

A major innovation, and key to an effective "systems approach," will be the use of farming systems research teams, involving agronomists, economists and sociologists, based on a farming systems perspective.* These teams will

*Livestock is an important component of some, but not all, Sri Lankan farming systems. In regions where livestock is important, relevant information will be gathered and analyzed. However, livestock is the responsibility of a separate ministry (Rural Industrial Development) with consequent problems in the integration/coordination of work. Therefore, apart from some work on pasture agronomy in cropping systems, livestock will not be directly considered, at least in the initial stage of project implementation.

be trained (as a group, to the extent possible) before they begin their work in the latest farming systems research (FSR) methodologies. Appropriate training programs will be identified through AID's Farming Systems Support Project (936-4099); likely training venues include the IARC's (e.g., IIRI, IITA) as well as certain national programs.

This approach builds on the ongoing work of the adaptive research teams, and is intended to strengthen and expand on current rice-based cropping systems work by placing attention on crop sequences and rotations in agro-ecological areas of water stress, on substitutability of SFC for rice under marginal soil conditions, and on cropping patterns and mixtures in the rainfed uplands. A major emphasis will be to increase basic research based on what is systematically learned regarding farmers' procedures, successes and constraints. Regular follow-up will enable identification of both changes in production technologies and further problems, leading back into research in an iterative process.

This approach will be combined with the use, as necessary, of problem-oriented interdisciplinary task forces, e.g., in integrated pest management, to bring an appropriate range of technical expertise to bear on all particular constraints. Land and water management research will focus on matching crops and soil types for effective and efficient water utilization, land preparation and tillage techniques for moisture conservation, and cropping practices that are compatible with water delivery and drainage systems, e.g., sequences and rotations that provide ground cover and/or residue mulch, thus promoting soil conservation.

Finally, the overall management of the SFC effort will be tightened up, integrating the findings of the economic and social studies and feedback on past trials into the annual technical work plan for the project. This should result in greater direction and identity for the SFC effort, and ensure the continuing relevance of the work.

Apart from the overall management improvement needs, SFC research is in need of significant professional and infrastructural improvements. All of the abovementioned RRC's suffer from infrastructural deficiency to varying degrees; working as well as living conditions are often difficult. These problems were highlighted in a recent review of the agriculture research centers and stations conducted by a team of experts from the International Service for National Agricultural Research. (Makandura and Karadian Aru RRC's, in particular are in urgent need of housing and work facilities.) Over the life of the project, the capabilities of the seven RRC's in the dry and intermediate zones will be upgraded in order for them to serve as regional centers of excellence in SFC-related technology, to plan and carry out quality research, and to support the work of the satellite stations. This will involve improving research and living facilities, providing needed laboratory, data processing and field equipment (including vehicles for the research teams and national coordinators to support an expanded work program, professional development (long- and short-term training in key areas), and technical assistance in key elements of the expanding research program, particularly in cropping systems agronomy and soil and water management.

Technical assistance requirements in research are covered in the Project Description. Training requirements for the two Divisions involved in research - Research, and Agricultural Economics and Projects - are discussed below. Long-term training needs for the Research Division, given present staff capabilities, projected increases (minimum of 17 Research Officers over LOP), personnel currently in training and the increased work programs

envisaged, have been determined by the DOA (and endorsed by project design consultants) to be 5 Ph.D. and 20 M.Sc. Candidates, already tentatively identified, are currently engaged in SFC-related work at the various dry and intermediate zone RRC's.

The DAEP will add six agricultural economists to undertake the expanded work program. Long-term training needs have been estimated at 2 Ph.D. (agricultural policy and production, and economics) and 4 M.Sc. (marketing, econometrics, farm management), with the objective of having at least one economist with advanced academic training at each of the seven participating RRC's, plus a core staff with advanced analytical and research capability to support and undertake the farming systems and special studies. Specific areas in which particular short-term training needs have been identified include farming systems, soil and water management, integrated pest management, plant breeding, marketing and research methodology.

The required LOP social science input will be obtained from the Agrarian Research and Training Institute (ARTI), University of Peradeniya or other local sources. Two M.Sc. in rural sociology/anthropology are planned under the project in order to strengthen local capability to provide needed social science support on a sustained basis to the DOA's research program. In addition, some short-term training in farming systems will be provided to meet near-term needs. (Further details on training for the research component are contained in annex B.8.)

Facilities at various RRC's are generally inadequate to undertake an expanded SFC research program (see ISNAR report). Priority needs include four laboratories, four equipment workshops, two stores, two cold storage facilities, four screenhouses, and 29 staff quarters. As mentioned above, the newest RRC's and the most deficient in all types of facilities, are Makandura and Karadian Aru. An additional laboratory, workshop and storeroom will be constructed early in the project at each of these stations, along with three staff quarters at the former and two at the latter to accommodate planned staff increases. Included among the 29 staff quarters are 14 (two at each participating RRC) for Economics Division field staff, who are currently without permanent housing. The additional quarters will be for new staff required for the project work program. (See Annex B.4 for further details on facilities, locations and specifications.) Commodity needs for the Research Division include farm equipment and laboratory equipment to implement an expanded research program, and vehicles to ensure the requisite mobility for the TA, the national coordinators, and the farming systems teams. Present plans call for allocation of three passenger vehicles in support of long- and short-term TA, four passenger vehicles for the national coordinators in oilseeds, grain legumes, coarse grain and cropping systems, and six utility vehicles for the initial RRC-based farming systems teams.

In the Economics and Project Division, commodity needs are largely confined to upgrading data processing capability to handle the increased volume of social and economic research, and vehicles. The latter will include one passenger vehicle for the long-term TA, and three utility vehicles for field work, two based at RRC's and one at HQ. (Additional details on commodity/equipment utilization are contained in Annex B.9.)

A World Bank general agriculture research project is currently in the early design stage for implementation starting in 1986 or 1987. This project could help upgrade the institutional capability of all the agriculture research institutions, including those of the DOA. USAID and the Bank are coordinating on project design and development.

3. SFC Extension

Two divisions of the DOA are involved in extension, namely Extension (which is responsible for the actual field dissemination of information to farmers by the KVS', or village level workers) and Educational and Training, which handles both in-service training of extension staff (largely at the In-service Training Institutes, or ISTI, *) and short-term vocational training, primarily at District Training Centers. The Education and Training Division also handles agricultural broadcasting through the three regional units of the Sri Lanka Broadcasting Corporation in Anuradhapura, Kandy and Ruhuna, and produces audio-visual training materials.

The extension cadre is organized by segments (there are two or three segments for each of the country's 24 administrative districts, 15 of which are located entirely or partially in the dry and intermediate zones) headed by an Agricultural Officer (AO). The AO is supported by a team of up to three Subject Matter Officers (SMO) who are responsible for training extension workers (usually fortnightly) in specific subject matter areas, varying in accordance with crops and production problems of particular segments. Reporting to the AO are the Agricultural Instructors (AI) and the village-level extension workers (KVS) in each segment, who visit farmers on a systematized and scheduled basis with specific technical information, and participate in other activities such as demonstrations, adaptive research trials and field days.

The four classes of extension staff are provided with systematic and regular pre-seasonal training by Subject Matter Specialists located at the regional ISTI's and by researchers from the RRC's. Additional training is provided to SMO's through monthly research/extension dialogues held at the RRC's; these provide an important mechanism for extension staff interaction with research personnel. The other mechanism is the Regional Technical Working Group-- see Section 2, above. Extension and training staff also assist in training farmers, farm youths and farm women at District Training Centers which are managed by the Education and Training Division.

The basic extension program of the DOA is sound, being based on the "Training and Visitation" (T&V) system initiated under the auspices of the World Bank-funded Agricultural Extension and Adaptive Research Project (AEARP). A good interaction between research scientists and extension personnel is developing through the RIWG. There are, however, two striking deficiencies relative to the SFC: primarily inadequate preparation of key categories of staff, specially the SMS', AO's and the SMO's; and neglect of the farming systems approach to research and technology transfer.

As in the case of research, it appears that extension work, in the form of on-farm trials and demonstrations, employs too much of a "top-down" approach. Properly trained and supported extension staff, alert to farming systems concerns, can help insure that work at the RRC reflects what is deliberately and systematically learned from the farmers and their farming operations, thus making research and technology transfer activities more relevant to farmers' needs.

As pointed out above, the SMS' are key figures in the training process. This cadre, however, is a newly created one, and most are recent university graduates in need of more experience and skills, particularly with respect to the SFC. Training is needed at the master's level and in the form of

* There are five regional In-service Training Institutes, and four more planned, each located in close proximity to a RRC.

short courses in such areas as plant protection, agronomy, land and water management, extension methodology and communications. In addition, materials and methodologies employed for the SFC at the ISII and District Training Centers are greatly in need of upgrading and expansion.

Because the SMO's train the field-level extension workers (AI's and KVS'), the quality of these field workers is highly dependent on the quality and effectiveness of the SMO's. There is an urgent need to better train SMO's in their areas of specialization. Finally, there is a need to upgrade the academic background of selected AO's, in order to increase their effectiveness in the RWS's and research extension dialogues.

This project proposes to strengthen the capability of an essentially soundly conceived and logically organized technology transfer system, enabling it to give greater emphasis to the SFC. Support will be complementary to that provided under the World Bank-support AEARP. The SMS' at the ISII, and the AO's and SMO's at the segment level, are singled out for emphasis because they are key personnel in the technology transfer process, and are not adequately trained or supported at present to meet the needs of a thrust to increase SFC production. Support to increase their effectiveness will be largely in the form of academic (to the master's level) and short-term training, mainly in the fields of agronomy, soil and water management, and farming systems methodology. A total of 30 master's degrees for AO's and SMS', to be posted at dry and intermediate zone ISII's and in segments where the SFC are especially important, is planned, plus 88 pm of short-term training.

The project will also provide limited support to improve the effectiveness of extension via the mass media. Farm broadcasting will be strengthened by facilitating the information gathering process for extension training officer; support will also be provided for the other media specifically targeted to the SFC. SMO's who organize and conduct film and slide shows will receive short-term training to increase their effectiveness in these media. In order to overcome recognized deficiencies in media, publications, and training and extension methodologies, 26 pm of short-term TA in these fields are planned under the project.

Mobility of extension staff, essential to thorough dissemination of information, is a continuing problem. The mobility of selected field staff in key SFC production areas will be increased through the provision of 15 utility vehicles, and 16 motorcycles. An additional three utility vehicles will be provided to improve the mobility and effectiveness (information gathering) of the farm broadcast units.

No increase in extension staff for this project is considered necessary. The emphasis, instead, will be on improving the effectiveness of existing staff, and their reassignment, where necessary, to realize greater impact with respect to the SFC. Five new SMS' will be recruited for the Education and Training Division, to concentrate on SFC at selected ISII's; the project will fund quarters for these new staff.

4. SFC Seed Production and Distribution

Sri Lanka's success in increasing the production of rice is due in large part to the availability of quality seed of the improved varieties. This will be especially true with the SFC where, traditionally, seed and labor constitute the principal inputs. Quality seed is also a significant extension tool, providing the extension agent with an important opportunity to introduce associated improved technologies along with the seed. No other

donor is currently addressing the question of SFC seed production and distribution, without which the desired production impact cannot be realized. Thus, improvement of the seed industry (production, processing and distribution) for the SFC will be an important component of the project. The project will support DOA production of foundation and registered seed and private sector production of grower (commercial) seed, which would then be processed and certified by the DOA.

Virtually all improved seed and planting materials (SFC as well as rice) in Sri Lanka are currently supplied through the Seed Division. In addition, the Division is responsible for maintenance of seed stocks, and for promoting and regulating the seed industry, including enforcement of quality standards. Seeds for sale to farmers are produced either directly on DOA farms (a total of 46) or by private contract growers (a total of 490 for the 1983-84 crop year) based on seasonal supply requirements estimated by the Extension Division, and then processed by the Seed Division and marketed through the Extension Division by cooperatives, Agrarian Service Centers, other retail outlets, and directly to farmers. The Seed Division is also responsible for preserving and multiplying breeders' seed through the first and second generations (foundation and registered seed) to serve as the basis for production of farmers' seed supplies.

The Division, through its own and contract grower production, is currently meeting roughly 33 percent of the annual requirement for rice seed, and only 5 percent of the annual requirement for SFC seed, with the balance coming from farmers' own stock or informal supply network.* For the 1983/84 Maha season the Seed Division handled 285 MI of SFC seed, 42 percent of which was produced by private growers. The Division is expected to meet its operational expenses through sale of seed, while at the same time keeping prices low. In practice, the latter objective is often met at the expense of the former.

The seed program in general has suffered from a variety of problems, among them: (1) limited storage and processing capacity; (2) inadequate capacity in production, processing, and marketing; (3) inadequate quality control (germination is often poor, with much mechanical mixing of varieties and a high percentage of "off-types"); and, (4) the lack of a clear seed policy to guide the development of the industry. Processing is a particular bottleneck, with priority in the use of existing facilities going to rice. In order to handle increased quantities of SFC seed on a timely basis, increased public and private sector capacity is essential. In the case of the SFC, all four problems are further complicated by the very embryonic nature of the market, which renders planning and investment highly problematic, and thus inhibits private investment.

Significant progress has been made in improving the rice seed program (with past assistance from the West German Government). Nearly all production of marketed seed is now in the hands of private contract growers, with the Seed Division's role limited to stock maintenance, and foundation and registered seed production. This is the model also being proposed for the SFC. The expansion of the capability of the DOA's seed Certification

*For self-pollinating crops, such as rice and most of the SFC, and considering the present stage of Sri Lanka's agricultural development, it is not necessary or desirable to supply totally new seed every year. Reasonable quality (non-hybrid) seed can normally be maintained by farmers through several generations, thus leading to a much more reasonable annual replacement requirement.

Service (being assisted by the Netherlands Government) to handle the SFC (now projected for 1985), is a crucial element in the development of a private seed industry.

Seed Division objectives over the LOP are:

- (1) Expansion of supply of seed of improved varieties of SFC to 10 percent of total annual requirement; by the 1988/89 crop year the Seed Division plans to handle 1,100 MT of SFC seed of all classes (a nearly fourfold increase over present levels), 60 percent of which would be produced by private growers;
- (2) Reduction of the role of the Division in seed production to maintenance/production of foundation and registered classes of seed, and a corresponding expansion of the private seed growers' role in the production and marketing of certified seed;
- (3) Organization of a quality control unit at each seed processing facility to monitor the quality of the seed being distributed;
- (4) Improvement of production, storage, processing facilities, and farming practices at DOA facilities to increase the efficiency of the seed production program; and
- (5) Creation of an environment favorable to the further development of a private seed industry.

The DOA is clearly committed to the above program. A draft national seed policy has been prepared and is now under active consideration at the ministerial level. The Seed Division has recently been elevated to independent divisional status within the DOA; of two constituent sections in the new Division, one is specifically charged with promoting and supporting the private seed industry. Uneconomical GSI seed farms are being closed or transferred to other divisions for other uses.

Of the 23 farms still involved in SFC seed production, four are also important as regional seed storage and processing centers, the capacities of which will be improved through this project. The Pelwehera farm will serve the central and north-central area of the country; the Aluththarama farm will serve the eastern area and Mahaweli Systems B and C; the Bata-Ata farm will serve the south and the Killinochchi/Paranthan farm and processing center will serve the northern area. A fifth region, Nikaweratiya, has no farm but does have 350-400 private growers who produce seed each year, and a DOA processing facility for growers' seed. Processing capacity at Nikaweratiya will also be expanded through the project.

While expanded private grower participation in SFC production will be particularly emphasized in the Niakweratiya region, encouragement and support (training, farm visits to monitor operations) for private certified growers will be a major part of the program in each of the other regions. Production of certified seed by private growers will require, at least initially, increased monitoring and support by the Seed Division. To this end, the Division plans to add eleven additional field staff to better coordinate and support the private grower program. Other new staffing needs within the Seed Division, e.g., for the quality control units, will be met by reassignment of existing personnel.

In order to realize the abovementioned objectives, the Seed Division requires both general and site-specific assistance. In terms of technical assistance, one long-term (24 pm) seed improvement specialist, with a broad background in seed industry development (private and public sector production, processing and marketing), is required in the early stage of the project to provide assistance in implementing the proposed changes, particularly in program management. In addition, a total of 30 pm of short-term TA in such fields as storage, processing and, especially, farm management and private industry promotion are planned, to be specified and programmed during implementation by the Project Management Unit. These individuals will be based in Peradeniya, and will work both on overall SFC seed program management; on further development of private sector participation in commercial seed production, and marketing; and on specific problems at DOA farms and processing centers.

Two Seed Division staff members will be trained in seed technology (one M.Sc. and one Ph.D.), to assume key technical roles in the Division, one at Division HQ in Peradeniya and the other at Pelwehera, the principal SFC production/processing facility. Short-term training (96 pm total) will be provided, primarily to Assistant Directors of Agriculture (ADA) supervising seed production and processing in the five regions, and the managers of the four farms, in farm management, quality control, processing and marketing.

In order to relieve the processing bottlenecks, five additional processing/storage facilities, five cold storage rooms (for maintenance of breeder seed and rhizobium) and five additional drying floors are required, plus some remodelling (to improve ventilation) of existing storage. Additional quarters are also required for new and reassigned staff. (Location of planned facilities is shown in Annex B.4.)

Principal commodity needs include equipment (processing and packing lines, bag cleaners, etc.) for the new processing facilities, and farm equipment (tractors and implements, maize threshers) to handle the projected increase in SFC seed production (principally foundation and registered seed) on DOA farms. Vehicle requirements include one passenger vehicle (for technical assistance advisors), eighteen motorcycles (for new and present staff in support of the outreach and private grower programs), and nine doublecab pickup trucks, one for each of the farms and regional offices.

5. Project Alternatives

Some form of SFC, rather than rice, emphasis is presupposed by the limited market for surplus rice. Alternatives to the proposed system of integrated interventions include limitations on: (a) subject matter (reduced number of crops or cropping systems, restricted to either rainfed or irrigated production); (b) scope (limited, e.g., to research or seed improvement); and, (c) geographic area. Taking these, in turn, a limited crop focus: (1) is not realistic in view of prevailing farming practices in which mixed or inter-cropping is, and will likely remain, a major element; (2) would limit responsiveness to changing markets or other economic factors-- an important consideration in view of the relatively immature nature of existing markets and the multiple-use characteristics (e.g., oil, livestock feed, direct human consumption) of the target crops; and, (3) is not consistent with GSL interests. Restriction to rainfed production would rule out the area of maximum potential production growth, while restriction to irrigated production would ignore the equity and upland soil resource conservation issues-- both matters of high priority to the GSL. Both of these options also ignore the integrated, rice-based nature of prevailing cropping systems, with both irrigated and rainfed elements.

SLP

A major limitation of project scope would severely limit prospects for significant productive impact, as virtually all program elements require major upgrading relative to the SFC. The Rice Research Project was able to successfully limit itself to research in large part because of other donor support to the other key program elements. Such other donor involvement is not available for this project.

Finally, limitation of geographic scope again conflicts with prevailing production patterns for the SFC-- there is a degree of regional production specialization, but in different areas for different crops-- and with the equity objective. For all the above reasons, the proposed geographically phased, broad-front, integrated farming systems approach, with an active monitoring element, appears the most relevant and likely to succeed under present conditions. Strengthening the institutional capacity of the LDA in this manner to work on the SFC will equip it to address regional and national objectives for the SFC both now and as they may change over time.

6 Engineering

An analysis of the technical feasibility of construction to be financed by the project is contained in the Engineering and Construction Analysis, Annex B.4.

B. ECONOMIC ANALYSIS (Summary)

Sri Lanka is expected to be self-sufficient in rice production within a few years. Once this occurs there will be little market growth potential for rice, as indicated in several recent studies, and there is basically no export potential for Sri Lankan rice in the foreseeable future. As a result, increasing attention needs to be focused on the SFC. Other policy considerations supportive of increased SFC production include nutrition, income and equity, resource conservation, and foreign exchange savings (or earnings).

Production potential is significant. Yields are below potential, and production has responded to past price incentives. A floor price scheme is in effect for most crops under consideration, and the market potential for SFC's is good. Increased cowpea, green gram and maize production will replace current imports while black gram, sesame and groundnuts are already being exported. Effective domestic demand for the SFC is projected to grow steadily during the LDP, with a potential for significant increases for some crops (e.g., soybean) depending on the prices of substitute products.

Marketing of SFC is carried out almost exclusively through the private sector, which has demonstrated its capability to efficiently and effectively expand its role in rice marketing. A recent study of SFC marketing concludes that there are no major structural impediments to SFC marketing; the present system is reasonably efficient and responsive, and should be able to accommodate anticipated production increases. However, the market situation and market potential for the SFC will be closely monitored during the LDP, and the resulting information incorporated into research and extension programming.

Ex-post economic assessments of agricultural research expenditures in other countries have shown consistently high internal rates of return (IRR). Under conservative assumptions, an IRR of 26.6 percent is estimated for this project. Full details are provided in Annex B.1.

C. SOCIAL SOUNDNESS ANALYSIS (Summary)

Sufficiently disaggregated data to enable a detailed profile of the target groups do not exist. The Social Soundness Analysis contains a preliminary profile, to be expanded upon during the LOP through planned social and economic studies and a baseline survey in the project area.

The dry and intermediate zones which comprise the target area for the project include 77 percent of Sri Lanka's total land area, 45 percent of the population, and 44 percent of the land under permanent cultivation. Agriculture in this area includes both shifting cultivation on the uplands, where the bulk of the SFC is presently produced, and settled (lowland) cultivation, the latter primarily in paddy rice. The dry and intermediate zones together account for two-thirds of the rice, and nearly all of the SFC, production in Sri Lanka.

An estimated 909,000 smallholder families (five million people) in the dry and intermediate zones comprise the target population. These include both residents of the "classic" or traditional villages, and the "colonists" of the new irrigated areas (e.g., the Mahaweli). Per capita income for the group is low relative to the national average per capita income of approximately \$300 per year. Income from the SFC varies widely, from \$13 to \$360 per year according to one study. The size of holdings tends to be small, with 63 percent of farmers owning less than one acre. The economic and social status of farmers without access to paddy land is clearly inferior. However, nearly 512,000 families (57 percent of the total target population) farm both paddy and uplands; they will comprise the principal project beneficiaries.

Sri Lanka's two main ethnic groups - the Sinhalese and Tamils - are well-represented in the project area, and both have a history of active involvement in SFC production. Both groups will benefit from the project. While communal tensions are a continuing and serious problem in Sri Lanka, they are not expected to materially affect the project.

The dry and intermediate zones are experiencing rapid population growth, both through encroachments and through officially sanctioned settlements. Equity considerations dictate that steps be taken to expand agricultural production and income in these areas to keep up with the rate of population increase. Rapid population growth also has serious implications for resource conservation and land tenure/fragmentation.

While overall per capita income has been increasing, there is strong evidence that an unfavorable equity shift has been taking place in the rural sector, with all but the highest 20 percent of income receivers experiencing diminished purchasing power. This project, through its work on the traditional upland crops and farming systems approach, should have a positive equity impact. The nutritional situation has also deteriorated countrywide, thus underscoring the need for increased production/consumption of high-protein, high-calorie coarse grains and pulses and livestock products.

Small farmers in Sri Lanka clearly do not constitute a homogenous group. Interventions therefore, must be tailored to specific situations. The farming systems approach should facilitate accommodation of a wide range of interests and the structuring of interventions to specific groups, including both commercial and marginal farmers.

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Sri Lankan farmers are innovative and responsive to market conditions, as attested to by the widespread use of new varieties of rice and the rapid adoption of soybean, a new crop. This demonstrated responsiveness and adaptability on the part of farmers are major plus factors for the project.

Potential constraints, as the SFC sub-sector develops, include land tenure, access to credit (both interrelated), tillage and scale of operations, and farmer organizations (in the case of irrigated production of the SFC). These will be carefully monitored over the LOP, and appropriate actions encouraged and supported.

Beneficiary participation will be achieved primarily by making SFC research genuinely farmer-oriented through a farming systems approach coupled with on-farm research and demonstrations. Short- and long-term technical assistance and training (including a farming systems workshop early in project implementation) will help assure this orientation.

D. ADMINISTRATIVE ANALYSIS (Summary)

The project will be implemented by the DOA, within the MADR. Five operational divisions, under the Director of Agriculture, and based at DOA headquarters in Peradeniya, will participate. Program planning and implementation are relatively decentralized; priorities are determined through regular interaction of central and field personnel, within overall guidelines from the MADR. The RIWG's play a key role in planning and implementing regional programs, while national coordinators plan and oversee national crop-specific programs. The overall DOA management structure is sound, but operational problems are often encountered due to cumbersome procedures and inadequate management practices. Management constraints will be addressed through project-funded technical assistance and training (see Project Description).

As outlined in the Technical Analysis, other institutional constraints must be addressed before any real progress can be made in increasing SFC production. There is a deficit of DOA staff in key technical and support positions, and a high percentage require further professional strengthening in specific disciplines. Numerous vacancies are found at the Regional Research Centers and In-Service Training Institutes caused in large measure by lack of professional support/development, and such basic needs as schooling, medical facilities, housing, water, and electricity. Work on the SFC is further constrained by inadequate research and seed production/processing facilities and equipment, and all five divisions are hindered by insufficient transportation. The GSL is aware of the importance of these issues, and many will be addressed by the project. To meet the needs of its expanded SFC program, the DOA plans to hire over 85 new professional and support staff in the first few years of the project. However, SFC-related work and training will have to be carefully programmed and monitored to avoid overloading the system, especially in view of the magnitude of training being proposed.

The DOA has considerable experience in commodity procurement, utilizing standard international procedures. Most procurement is subject to tendering, with varying approval authority at different levels of the organization. Overall GSL procurement procedures and controls, while cumbersome and time-consuming, are workable. However, management of major international procurement actions from DOA headquarters in Peradeniya is problematic and the DOA, therefore, will contract with a U.S. procurement service agent to handle the majority of project-funded off-shore procurement. Commodity management procedures - receipt, inspection, inventory, storage and distribution - have been reviewed and are considered adequate.

The Civil Engineering Section (CES) of the DOA is responsible for design and construction of all types of buildings and facilities used by the DOA. Because the CES' normal work load utilizes most of its present staff, the design and supervision of construction services under the project will be contracted out to a private A&E firm. Project-financed construction will be undertaken by local private firms, competitively selected, and will be phased over the first five years of implementation to meet anticipated budgetary and administrative limitations. Delegation of construction tendering and approval authority is comparable to that for commodity procurement. The CES is fully competent to manage construction tendering and to supervise the A&E firm and construction contractors.

A Project Coordinating Committee (PCC), chaired by the Secretary, MADR, and including the DA, the Project Manager, contract Chief-of-Party, the USAID Project Officer, and representatives of other GSL institutions as appropriate, will be established to provide overall guidance and coordination. Day-to-day project operations will be managed by a Project Management Unit (PMU). The PMU will include a full time Project Manager to be appointed by the DA. The PMU will be headed by the DA or his designee. This Unit will have both technical and administrative staff.

E. ENVIRONMENTAL IMPACT

The Initial Environmental Examination (IEE) included in the PID, which recommended a negative determination, was approved by the Asia bureau on July 8, 1983 (see APAC Review Cable, Annex A.1). The project addresses the need for sustainable utilization of natural resources in the production of subsidiary field crops under both rainfed and irrigated conditions. Recognizing the long-term land and water use implications of increased and intensified SFC production, the project will promote sound resource management practices through technical assistance and training in land and water use management for application in the project area (dry and intermediate zones) and through inclusion of environmental concerns in the agenda for farming systems research teams. In addition, a covenant will be included in the Project Agreement which provides that the GSL will "closely monitor land use in the dry and intermediate zones and... actively promote rational land use including watershed protection, enforcement of limits on chena cultivation, and regularization of tenure."

Construction under the project is limited to 12 agricultural research and seed processing sites. While there will initially be some disruption as construction work is undertaken, the new or rehabilitated facilities will have a favorable impact on the working and living environment at these sites. USAID engineers will work with the DOA and engineering design and supervision firm to assure that all facilities are optimally located and that adequate provision is made for water, sewerage, electrical supply, and access roads.

VIII. CONDITIONS AND COVENANTS

A. Conditions Precedent to Disbursement

1. Conditions precedent to initial disbursement, in addition to the standard legal opinion and designation of authorized representatives:

a) Evidence that a Project Coordinating Committee acceptable to AID, and a project Management Unit have been established and that a Project Manager, acceptable to AID, has been designated; and

b) Evidence that adequate budgetary resources for project needs in 1985 are programmed for inclusion, or have been included, in the GSL's budget for 1985.

2. Condition precedent to disbursement for training: Preparation by the GSL of a training plan, satisfactory to AID, for long-and short-term training to be funded under the project.

3. Condition precedent to disbursement for construction: Evidence, satisfactory to AID, that a contract, acceptable to AID, for engineering and construction supervision for all project-financed construction has been executed.

B. Covenants

In addition to the standard covenant on evaluation, the GSL will covenant to take the following actions:

1. Assure that sufficient qualified professional and support staff are hired in a timely manner to meet the requirements of the project as specified in Annex 1 to the Project Loan and Grant Agreement.

2. Assure (a) that all participant training under the project financed by AID will be accomplished in accordance with the policies, allowances, and reporting requirements in AID Handbook 10, Participant Training, (b) that employment in a position relevant to the training received under the project will be available for each participant immediately upon completion of his or her training for a period of not less than one year, or not less than three times the length of training, whichever is longer, and, (c) that no action will be taken by the GSL to relax any post-training obligation of any participant without prior AID approval.

3. Ensure that appropriate Sri Lankan institution(s) provide the requisite social science (sociology/anthropology) inputs to the project in a timely manner acceptable to AID.

4. Ensure that plans, specifications and sound cost estimates are prepared in a timely manner for all construction to be financed under the project, as outlined in Annex 1 to the Project Loan and Grant Agreement.

5. Prepare annual work plans, including an updated training plan, not later than May of each year for implementation of the project during the subsequent calendar year.

6. Promulgate a national seed policy which will regulate, support and encourage the development of the seed industry, including an expanded private sector role in seed production and marketing.

7. Actively monitor and promote development of markets for subsidiary field crops and otherwise ensure adequate incentives for their production.

8. Monitor and take necessary steps to provide an acceptable living and work environment for DOA staff in remote locations (e.g., Regional Research Centers and seed processing centers).

9. Closely monitor land use in the dry and intermediate zones, and actively promote rational land use including watershed protection, enforcement of limits on chena cultivation, and regularization of tenure.

LX. EVALUATION ARRANGEMENTS

Evaluation is a critical element of the project, both to determine the project's operational effectiveness and to assess its impact at the purpose and goal levels, i.e., strengthened institutional capability on the one hand, and improved farmer income, employment and nutrition on the other.

Two types of evaluation will be carried out during the life of the project: One will assess the speed and effectiveness of project implementation (process), while the other (impact) will determine (a) the degree to which project outputs are achieving, or have achieved, the project purpose, and (b) how achievement of project purpose is contributing to the project goal.

Three major evaluations are planned:

1987 (April)	- process evaluation
1988 (September)	- mid-term process and impact evaluation
1992 (May)	- end-of-project impact evaluation.

Each is described in more detail below, together with proposed evaluation team composition and cost. The Financial Plan includes \$217,000 for evaluation (including contingency and inflation). In addition to the three scheduled evaluations, the project will be reviewed each February or March by the DOA, USAID and contractor personnel, with the exception of 1987 when the annual review will be replaced by the first project evaluation (see Monitoring Plan).

A. First Interim Evaluation

The first evaluation is planned for April 1987. At that point, the contractor will have been at work two years and there will have been sufficient implementation experience to assess: (a) inputs and their delivery, (b) the project management system, (c) coordination with other donors, and, (d) participation by GSL officials at all levels in the farming systems research approach. Initial crop emphases will also be reviewed and adjusted, as necessary, as will the timetable for phasing in assistance to research stations and seed farms. The relationship between the SFC effort and rice production will also be assessed. The evaluation team will also review the adequacy of baseline data (see section D, below) for the mid-term and end-of-project evaluations.

The evaluation will be conducted by a joint USAID/GSL team over a two-week period. In the event outside assistance is required, \$25,000 has been included in the evaluation budget for U.S. and/or Sri Lankan consultants.

B. Second (mid-term) Evaluation

A second evaluation will be conducted approximately four years into project implementation, in about September 1988. This will be a major, mid-point review, conducted by an outside team with USAID and GSL participation as appropriate. A four-week evaluation is planned, at an estimated cost of \$72,000 (3 pm x \$24,000). The evaluation will address both process and impact issues. While it will be premature to assess project impact, per se, sufficient implementation experience will have been gained to permit some preliminary judgments about output, purpose

and goal linkages, and progress towards EOPS. Thus, the evaluation should address: (a) progress in strengthening DOA institutional capabilities vis a vis the SFC, including effectiveness of SFC-related technology transfer to farmers (adoption rates) and constraints to adoption of research results and improved technology; (b) progress in establishing SFC research strategies and priorities based on farmer needs and market realities, including institutionalizing a farming systems approach to research and technology transfer; and, (c) availability of adequate stocks of quality seeds, their timely distribution to farmers, and the overall private sector role in the seed industry.

C. Final or Impact Evaluation

The final project evaluation is planned for late in the eighth year of implementation, o/a May 1992. This evaluation will serve as a final wrap-up on implementation effectiveness and output achievement. Its main objective, however, will be to assess project impact at the purpose and goal levels. It will be undertaken by an independent team with the assistance of USAID and GSL personnel as appropriate. Potential consultant sources include U.S. universities and international research centers. The financial plan includes \$120,000 for the final evaluation (4 pm x \$30,000).

Measures of enhanced institutional capacity at the purpose level include:

1. Progress made in institutionalizing and implementing a multidisciplinary, problem-oriented farming systems research approach;
2. Number and utility of SFC research interventions (production technology and cropping systems) identified;
3. Number and kind of economic and social studies completed and their utilization in agronomic research;
4. Volume, means and quality of SFC seed production, processing and distribution, including the relative roles of the DOA Seeds Division and the private sector;
5. Volume and rate of increase in farmer purchase of certified SFC seed;
6. Number and content of extension training programs in SFC;
7. Number and utility of extension contacts with SFC producers;
8. Number of SFC-related contacts with external institutions, including the IARCs; and,
9. Adequacy of GSL/MADR support, including budget support, to the DOA's continuing program in SFC research, technology transfer, and seed production/distribution.

It will take much longer than the life of the project to realize fully the project's employment, income and nutrition goals. Assessments can nevertheless be made to determine to what degree the project has helped to create the means to achieve these goals in the future. Thus, while long-term research undertakings, e.g., in plant breeding, are not expected to have an impact on income and employment during the project life,

benefits from adaptive research can be expected to start accruing during the latter years of the project. For example, the identification of suitable, improved small farm management practices, and the development of improved cropping systems, including means to control crop diseases and pests and reduce soil erosion, could increase farmers' income and generate more employment. Success in research along these lines and in trials under farmers' conditions would be indicators of success which could be expected to be fully realized later. A strong positive indicator would be evidence that physical or biological research under the project is strongly based on FSR and farm level study findings.

The amount of increased farm family employment can be measured by: (a) the number and distribution of farm work days per acre in SFC cultivation, and (b) by the aggregate work days involved. Changes in income may come from increased per unit yields of land and labor, or from improved farming systems that relieve labor constraints during certain farm operations, or taking better advantage of agro-climatic conditions and markets. Changes, if any, in the price structure of inputs and produce will also be assessed.

Interim benchmarks will be developed early in the project for use in the mid-term evaluation planned for 1988. In addition, some provision for post-project evaluation is recommended since, as indicated above, major benefits of the project at the goal level will not fully materialize until some years after project completion when new SFC varieties and farming practices have become available and widely adopted.

D. Baseline Data

Baseline data will be collected early in project implementation, both to meet project evaluation needs, and as an input into SFC research. A baseline survey of a representative farm sample will be undertaken July-October 1985, with guidance from the technical assistance contractor in planning for the survey and its periodic update.* Findings of this survey will be augmented by material already collected by the DOA, and by data from other GSL sources.

The survey will include both qualitative and quantitative information on variables, on both a crop specific and farm unit basis, that directly and indirectly affect employment and income. If the survey identifies particular measures to improve marketing in the target areas, evidence of the adoption of these measures and of their effects will also be important in assessing project impact. Data on specific employment and income-related indicators to be collected during the baseline survey for monitoring and end-of-project evaluation might include the following:

- amount and distribution of work days per farm family member spent on crops (individually and collectively and livestock
- total workdays per unit of land;
- amount of other inputs by crop, e.g., fertilizer, pesticide, seed;

*The project budget includes \$200,000 for social and economic studies, of which the baseline survey will be the first.

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- number of days of off-farm employment available to the farm family;
- output per unit of land;
- total return per day of farm work;
- size of net farm income generated from the SFC and from rice; and,
- absolute amount and proportion of SFC produce consumed at home.

Finally, macro-indicators, such as total SFC export or import and the volume of SFC used in livestock feeds, will be considered.

The regular farm level studies (FLS) and FSR activities will employ both structured questionnaires and qualitative assessments of conditions based on field visits by multidisciplinary teams of DOA scientists. The data files of the FLS, and the written reports of FSR work (exploratory visits, verification visits, for research both on-station and under farmers' conditions) and other research reports and analyses will be collected and maintained, and will all constitute valuable resources for evaluation purposes.

A N N E X E S

ANNEX A. LEGAL EXHIBITS

ACTION

TELEGRAM

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SUBJECT: DIVERSIFIED AGRICULTURE RESEARCH PID (383-0058)
 - APAC REVIEW

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1. ASIA PROJECTS ADVISORY COMMITTEE (APAC) REVIEWED PID ON JULY 8, 1983. PID IS APPROVED FOR DEVELOPMENT OF PP. BECAUSE OF NUMEROUS POLICY ISSUES INVOLVED AND FACT THAT THIS WILL BE FIRST BUREAU DRYLAND AGRICULTURE PP TO BE SUBMITTED AFTER ISSUANCE OF BUREAU RAINFED PROGRAMMING GUIDANCE PAPER, REQUEST MISSION SUBMIT PP TO AID/W FOR AUTHORIZATION. COMMENTS AND SUGGESTIONS FOR DEVELOPMENT OF PP FOLLOW:

② PROJECT FOCUS AND OBJECTIVES. REQUEST PP IDENTIFY CLEAR AND CONCISE PROJECT RESEARCH FOCUS AND OBJECTIVES. PP SHOULD IDENTIFY AREAS OF RESEARCH THAT ARE MOST RELEVANT AND PROMISING GIVEN RANGE OF CONSTRAINTS AND GSL POLICIES. MISSION SHOULD IDENTIFY CRITERIA THAT WILL BE CONSIDERED IN IDENTIFYING RESEARCHABLE ACTIVITIES AND EXPLAIN THE SIGNIFICANCE OF THESE FACTORS IN TERMS OF THEIR EFFECTS ON DRYLAND AGRICULTURE. CAREFUL DEFINITION OF PROJECT OBJECTIVES WILL BE IMPORTANT IN ORDER TO MAINTAIN THE INTEGRITY OF THIS RESEARCH ACTIVITY. IT WILL ALSO ENSURE THAT ITS OBJECTIVES ARE NOT TOO AMBITIOUS AND THAT THEY ARE OBTAINABLE WITHIN LOP.

③ POLICIES: GSL DRYLAND AGRICULTURE PRICING, MARKETING AND OTHER POLICIES WILL BE IMPORTANT FACTORS IN SUPPORTING DRYLAND RESEARCH ACTIVITIES AND OVERALL SUCCESS OF PROJECT. THE PP SHOULD DESCRIBE THE POLICY CONTEXT OF THE PROJECT, IDENTIFYING AREAS THAT APPEAR MOST PROMISING FROM POLICY PERSPECTIVE WHERE THERE IS LEVERAGE TO MODIFY EXISTING POLICY STRUCTURE. WE ARE AWARE THAT GSL WITH MISSION SUPPORT IS WORKING ACTIVELY ON NATIONAL AGRICULTURE FOOD AND NUTRITION STRATEGY AND STRONGLY SUPPORT YOUR EFFORTS. THIS IMPORTANT INITIATIVE SHOULD BE DESCRIBED IN THE PP AND THE COORDINATION AND FINE-TUNING WITH DRYLAND PROJECT POLICY ACTIVITIES ELABORATED.

④ SEED PRODUCTION STRATEGY. APAC DISCUSSED THE AREAS WHERE PUBLIC SECTOR INVOLVEMENT IN SEED PRODUCTION MAY BE APPROPRIATE, I.E., MAINTENANCE OF FOUNDATION STOCK, SEED CERTIFICATION, POLICY GUIDANCE, SUPERVISION AND QUALITY CONTROL, REGULATION OF PRIVATE SECTOR SEED INDUSTRY AND OTHERS. WHILE WE ACCEPT THE LEGITIMACY OF A PUBLIC SECTOR ROLE IN SUCH AREAS, WE ENCOURAGE MISSION TO HELP GSL SORT OUT WHICH SEED PRODUCTION, PROCESSING, STORAGE, MARKETING AND DISTRIBUTION ACTIVITIES MIGHT BE UNDERTAKEN

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BY THE PRIVATE SECTOR FROM THE BEGINNING OF THIS ACTIVITY AND IDENTIFY THOSE THAT REQUIRE A TRANSITION PHASE AND DEVELOP PROJECT PLANS ACCORDINGLY. AID-FINANCED PUBLIC SECTOR INVESTMENTS FOR EQUIPMENT AND FACILITIES SHOULD BE MADE IN AREAS WHERE THERE WILL BE A CONTINUING LONG-TERM INVOLVEMENT THAT IS SUPPORTED BY PROJECT AND OTHER LONG-RANGE POLICY PLANS. WE ENCOURAGE MISSION TO DEVELOP DIALOGUE AS SOON AS POSSIBLE WITH PRIVATE AND PUBLIC SECTOR GROUPS OVER SEED PRODUCTION AND MARKETING ACTIVITIES. WE SUGGEST MISSION ANALYZE WHAT WILL MAKE THIS ACTIVITY ATTRACTIVE TO PRIVATE SECTOR AND PROMOTE THEIR PARTICIPATION. MISSION WILL WANT TO REVIEW SEED PRODUCTION ACTIVITIES IN THAILAND AND ELSEWHERE.

5) CONTRACTING. SUGGESTION WAS DISCUSSED THAT MISSION CONSIDER JOINT VENTURE WITH PRIVATE SECTOR AND UNIVERSITY FOR OVERALL PROJECT CONTRACT. WHILE THIS REMAINS AN OPTION THAT THE MISSION MAY WISH TO CONSIDER, APAC NOTED THAT A SINGLE CONTRACT WITH ONE PRIVATE ENTITY MAY BE PREFERRED FOR REASONS OF SIMPLICITY OF MANAGEMENT AND CLEAR LINES OF CONTRACTUAL RESPONSIBILITY.

6) MARKETING. APAC NOTED THAT, APPROPRIATELY, MARKETING IS NOT A COMPONENT IN THIS RESEARCH ACTIVITY. HOWEVER, THE PROJECT WILL NOT BE SUCCESSFUL UNLESS THERE ARE

RELATIVELY ATTRACTIVE AND ACCESSIBLE MARKETS FOR SECONDARY CROPS. CONSEQUENTLY, AN IN-DEPTH MARKET ANALYSIS OF DRYLAND CROPS WILL BE REQUIRED. THIS ANALYSIS WILL SERVE TO FOCUS THE PROJECT RESEARCH ACTIVITIES AND ASSIST IN THE SELECTION OF CROPS FOR RESEARCH AND POLICY ENVIRONMENT. SMALL FARM MARKETING ACCESS PROJECT SUPPORTED BY ST/MD ADDRESSES MARKET MONITORING AND ANALYSIS ACTIVITIES AND MAY BE ABLE TO PROVIDE ASSISTANCE TO MISSION WITH MARKET ASSESSMENT, MONITORING AND FOLLOW-UP ACTIVITIES FOR PP DEVELOPMENT AND PROJECT IMPLEMENTATION IF APPROPRIATE.

7) RESEARCH MANAGEMENT. APAC CONCURS WITH PID REQUEST FOR DESIGN ASSISTANCE FOR RESEARCH ADMINISTRATION AND MANAGEMENT. PP SHOULD EXPLAIN RESEARCH ORGANIZATION, MANAGEMENT, AND ADMINISTRATIVE MECHANISMS AND INSTITUTIONAL AS WELL AS PERSONNEL INCENTIVES AND IDENTIFY MODIFICATIONS THAT WILL BE DEVELOPED IN THE PROJECT. THE RELATIONSHIP OF RESEARCH STATIONS AND CENTRAL RESEARCH EFFORTS, THE FARMING SYSTEMS METHODOLOGY AND BASIC RESEARCH

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AND LINKAGES WITH FARMERS (TWO-WAY FLOW OF INFORMATION) AND TO POLICY FORMULATION SHOULD ALSO BE EXPLAINED. WHERE APPROPRIATE THESE ACTIVITIES SHOULD BE LISTED AS PROJECT OUTPUTS AND TECHNICAL ASSISTANCE PROVIDED TO ADDRESS THESE ISSUES IN THE IMPLEMENTATION STAGE.

8) SOIL-WATER MANAGEMENT AND AGRO-CLIMATOLOGY. ALTHOUGH PID IDENTIFIES SOIL-WATER MANAGEMENT AND AGRO-CLIMATIC CONSTRAINTS, PROJECT ACTIVITIES TO IMPROVE RESEARCH AND INSTITUTIONAL CAPABILITIES TO ADDRESS THESE CONSTRAINTS ARE NOT SPECIFICALLY IDENTIFIED. IT WAS APAC VIEW THAT SOIL-WATER MANAGEMENT AND AGRO-CLIMATOLOGY ARE RELEVANT TO FARMING SYSTEMS METHODOLOGY AND NECESSARY FOR DRYLAND CROP DEVELOPMENT. REQUEST MISSION REVIEW REQUIREMENTS

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FOR TECHNICAL ASSISTANCE AND TRAINING FOR THESE ACTIVITIES AND INCLUDE IN PROJECT DESIGN.

9. CHENA CULTIVATION. CHENA CULTIVATION IS SEEN AS A RESULT OF THE COMPLEX INTERACTION OF NATURAL RESOURCE BASE, SOCIO-ECONOMIC, AGRICULTURAL AND OTHER FACTORS. SINCE, AS INDICATED IN PID, GEL HAS MOVED TO OUTLAW NEW CHENA CULTIVATION AND ENFORCE THIS POLICY, THE AID-ASSISTED PROJECT SHOULD EMPHASIZE THE PRACTICAL AND SUSTAINABLE ALTERNATIVES TO CHENA CULTIVATION AND ANALYZE THE EFFECT THE ALTERNATIVES WILL HAVE ON CHENA FARMERS.

10. NUTRITION. SINCE THIS PROJECT WILL FOCUS ON SMALL AND LOW INCOME FARMERS, NUTRITIONAL CONSIDERATIONS SHOULD FIGURE PROMINENTLY IN CROPS AND FARMING SYSTEMS ANALYSES. NUTRITION SHOULD ALSO BE AN ADDITIONAL CRITERION IN FOCUS

OF PROJECT RESEARCH ACTIVITIES AND SELECTION OF CROPS FOR RESEARCH. APPROPRIATE TECHNICAL ASSISTANCE AND THE DEVELOPMENT OF NUTRITION INSTITUTIONAL RESEARCH CAPABILITIES AND/OR LINKAGES WITH RELEVANT NUTRITION INSTITUTIONS SHOULD BE DESCRIBED IN PROJECT.

11. FORAGE AND LIVESTOCK. SINCE LIVESTOCK OFTEN PLAYS IMPORTANT ROLE IN OVERALL CROP AND FARM SYSTEMS, PROJECT DESIGN SHOULD INCLUDE FORAGE AND LIVESTOCK/ANIMAL RAISING RESEARCH OBJECTIVES AND PROVIDE INPUTS AS NEEDED. ALSO, AS NOTED IN PID, LEGUMES ARE IMPORTANT COMPONENTS OF LIVESTOCK RATIONS, BOTH GRASS LEGUMES AND FORAGE CROPS HAVE POTENTIAL FOR IMPORTANT NITROGEN FIXING PROPERTIES. CROPS WITH NITROGEN FIXING PROPERTIES SHOULD FIGURE PROMINENTLY IN DEVELOPMENT OF CROP AND FARM SYSTEM RESEARCH ACTIVITIES AND RECOMMENDATIONS.

12. RECURRENT COST ANALYSIS. A RECURRENT COST ANALYSIS FOR DIVERSIFIED AGRICULTURE RESEARCH ACTIVITIES SHOULD BE CONDUCTED AND CONSIDERED IN PROJECT FINANCIAL AND IMPLEMENTATION DESIGNS.

13. COARSE GRAINS SUBSTITUTION. PID NOTES THAT MISSION AND RECENT PL-490 EVALUATION HAVE CONCLUDED THAT WHEAT IMPORTS HAVE APPARENTLY NOT BEEN A DISINCENTIVE TO PADDY PRODUCTION; HOWEVER, THEY MAY HAVE ADVERSELY AFFECTED THE PRODUCTION OF COARSE GRAINS. AS SUCH, MISSION SHOULD CONSIDER THE EXTENT TO WHICH COARSE GRAINS--SORGHUM, MAIZE, AND OTHER CROPS TO BE DEVELOPED FOR DRYLAND AGRICULTURE UNDER THIS PROJECT--ARE EVER LIKELY TO BECOME CLOSE SUBSTITUTES FOR WHEAT. ALTHOUGH CONSUMERS MAY, IN SOME CASES, SUBSTITUTE COARSE GRAINS FOR WHEAT, DEPENDING IN PART ON RELATIVE PRICES (AND PERHAPS CONSUMER PREFERENCES), THE EVALUATION CONCLUDED THAT THIS WOULD BE HIGHLY UNLIKELY.

14. EXTENSION. PID DESIGN DOES NOT PROPOSE AN EXTENSION COMPONENT FOR THIS RESEARCH ACTIVITY. WHILE WE ARE NOT SUGGESTING DEVELOPMENT OF EXTENSION COMPONENT SINCE, AS MISSION POINTS OUT, WORLD BANK IS WORKING IN THIS AREA, EXTENSION WILL NEVERTHELESS PLAY A VITAL ROLE IN GETTING RESEARCH OFF THE SHELF. FURTHER, AN APPROPRIATE AND WELL CONCEPTED AND IMPLEMENTED EXTENSION SYSTEM WILL COMPLEMENT FARMING SYSTEM METHODOLOGY AND SUPPORT CROP AND FARM SYSTEM RESEARCH ACTIVITIES. WORLD BANK T AND V SYSTEM MODEL NOW CURRENTLY IMPLEMENTED IN IRRIGATED AREAS MAY HAVE TO BE ADAPTED FOR DRYLAND FARM CONDITIONS AND PROPOSED NEW CROP AND FARM SYSTEM ACTIVITIES. TA FOR

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SUCH A REVIEW MAY BE AVAILABLE FROM ST FARMING SYSTEMS PROJECT AND/OR NEW INITIATIVES IN ST/MD FOR INSTITUTIONAL DEVELOPMENT FOR TECHNOLOGY TRANSFER. ST/MD WOULD CONSIDER ASSISTING IN SUCH A REVIEW IF MISSION DESIRES. REQUEST MISSION REVIEW IMPLEMENTATION OF WORLD BANK EXTENSION PROJECT AND REQUIREMENTS FOR ADAPTATION TO DRYLAND CONDITIONS AND PROJECT ACTIVITIES. MISSION SHOULD ALSO EXPLAIN HOW PROJECT IMPLEMENTATION WILL BE COORDINATED WITH WORLD BANK EXTENSION PROJECT.

15. SOCIAL SCIENCE ANALYSIS. THE PP SHOULD EMPHASIZE SOCIAL SCIENCE DIMENSIONS IN DESIGN AND EVALUATION OF PROJECT RESEARCH ACTIVITIES, E.G., LABOR AND GENDER IMPLICATIONS OF CROP SELECTION, INCOME DISTRIBUTION, FOOD PREFERENCES, INSTITUTIONAL MECHANISMS, SOCIO-ECONOMIC DATA COLLECTION, ETC.

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16. CONSTRUCTION OF FACILITIES AND COMMODITIES. PP SHOULD DESCRIBE PLANS FOR DESIGN AND CONSTRUCTION OF RESEARCH AND SEED FACILITIES. IN ADDITION, IMPLEMENTATION PLAN FOR PROCUREMENT OF RESEARCH EQUIPMENT AND COMMODITIES SHOULD BE EXPLAINED IN PP.

17. ADDITIONAL GUIDANCE. WITHIN A WEEK, ALL ASIA MISSIONS WILL RECEIVE A CABLE ON "PROGRAMMING CONSIDERATIONS FOR INVOLVEMENT IN RAINFED AGRICULTURE." CABLE WILL PROVIDE FURTHER GUIDANCE TO MISSION IN DEVELOPING PP. CABLE CONTENT IS BASED ON DISCUSSIONS AT 1983 HYDERABAD CONFERENCE, RELEVANT DOCUMENTS, AND EXPERT CONSULTATIONS. SINCE MISSION WILL BE RECEIVING CABLE SHORTLY, WE WILL NOT SUMMARIZE DOCUMENT HERE. HOWEVER, WE NOTE THAT THE GUIDELINES STRESS FOOD SECURITY--INCREASED PRODUCTION OF BASIC FOODGRAINS MUST REMAIN A HIGH BUREAU PRIORITY. CONSEQUENTLY, MISSIONS CONSIDERING A NEW PROJECT IN RAINFED AGRICULTURE WILL NEED TO MAKE A THOROUGH ANALYSIS OF THE HOST COUNTRY'S (A) CURRENT BASIC FOODGRAIN PRODUCTION PERFORMANCE STATUS, AND (B) THE LIKELY RATES OF PRODUCTION GROWTH IN THE FUTURE. THE ANALYSIS IS TO INCLUDE AN ASSESSMENT OF THE HOST COUNTRY'S COMMITMENT TO A STRONG, CONTINUING EFFORT TO MAINTAIN GROWTH IN BASIC FOOD GRAIN PRODUCTION.

18. INITIAL ENVIRONMENTAL EXAMINATION (IEE). MISSION RECOMMENDATION FOR NEGATIVE IEE DETERMINATION APPROVED. MISSION IS COMMENDED ON WELL-PREPARED ENVIRONMENTAL ANALYSIS. IDENTIFICATION OF PRIORITY RESEARCH TO ADDRESS EXISTING PROBLEMS OF LAND RESOURCE DEGRADATION AND OTHER ENVIRONMENTAL CONSTRAINTS ATTENDING DRYLAND AGRICULTURAL DIVERSIFICATION VIEWED AS IMPORTANT ELEMENT OF PP DESIGN.

19. PROJECT DESIGN ASSISTANCE. BUREAU HAS ALLOCATED DOLS 60,000 PD AND S FUNDS FOR PROJECT DESIGN ASSISTANCE. AN ADDITIONAL DOLS 62,000 HAS BEEN RESERVED BRINGING TOTAL PD AND S AMOUNT TO DOLS 122,000. SEPTEL WILL ADVISE AVAILABILITY OF DESIGN CONSULTANTS. SHULTZ

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Life of Project:
From FY 84 through FY 92
Total U.S. Funding \$11,400,000
Date Prepared: May 7, 1984

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Project Title & Number, Diversified Agriculture Research, 383-0088

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS																																																		
<p>Program or Sector Goal:</p> <p>Increased small farmer income and employment in the dry and intermediate zones, and improved nutrition</p>	<p>Measures of Goal Achievement:</p> <ol style="list-style-type: none"> Gross and per acre production of SFC increasing; Returns to labor in SFC production increasing; Incomes of dry and intermediate zone farmers increasing; and, Increased availability of target crops at affordable prices, for all income groups. 	<ol style="list-style-type: none"> Department of Agriculture (DOA) survey findings; Census and Statistics data; and Agro-socio-economic studies. 	<p>Assumptions for achieving goal/targets:</p> <ol style="list-style-type: none"> Continued political stability and economic growth; Normal weather patterns; and Economics of SFC production remain positive. 																																																		
<p>Project Purpose:</p> <p>To strengthen the institutional capability to generate and effectively transfer technologies and seed required to increase and sustain SFC production on small farms.</p>	<p>Conditions that will indicate purpose has been achieved: End of project status:</p> <ol style="list-style-type: none"> Improved SFC varieties and production practices, appropriate to regionally differentiated farming conditions, being identified and disseminated to farmers; Research strategies and priorities being set on the basis of farmer and market needs; Upgraded and rationalized SFC seed processing and marketing system in operation meeting a minimum of 10% of annual SFC seed requirements with a growing private sector role in certified seed production and marketing; Increased understanding of SFC cropping patterns and of social and economic factors affecting production reflected in DOA decision making; and, Integrated intra-divisional management system for SFC-related activities in operation. 	<p>Project evaluation:</p> <ol style="list-style-type: none"> Project records, including Dept. Site visits; DOA program; and Project-funded and other studies. 	<p>Assumptions for achieving purpose:</p> <ol style="list-style-type: none"> DOA able to recruit and retain quality personnel; and GSL maintains priority on SFC. 																																																		
<p>Outputs:</p> <ol style="list-style-type: none"> Increased number of better trained personnel engaged in SFC agro-socio-economic research, extension, and improved seed systems; Improved physical facilities (seed storage and handling, laboratories, green houses, etc.) at research stations and seed farms; Effective linkage between research, improved seed, extension and training for SFC; Series of socio-economic studies completed; Improved linkages in place between Department of Agriculture, International Research Institutes, and other national agricultural research seed centers; Improved seed production, processing and distribution system in operation; Increased numbers of high yielding varieties of SFC; Increased and broadened germplasm collection of SFC; and, Increased knowledge of SFC cropping patterns. 	<p>Magnitude of Outputs:</p> <ol style="list-style-type: none"> Sixty-one advanced degrees; 5% of short-term training; Seven regional research farms and 4 seed farms and one seed processing center with upgraded physical facilities and equipment; Increased extension input into research programming, improved design and implementation of on-farm trials, improved training of extension staff, especially SMS and SMO; Farm-level studies program of Division of Economics and Projects established and continuing to monitor agricultural development variables on a long-term basis; number of analyses based on these studies completed; increased multi-disciplinary work involving physical, biological and social sciences underway, with both DOA and outside personnel in the latter disciplines participating; Regular exchange of information among personnel through programmed training, visits and workshops; Improved seed quality; reduction of losses, adequate and timely supply; Systematic release of improved SFC varieties tailored to specific agro-climatic conditions; Regularized introduction of potentially valuable germplasm being utilized and maintained; and, Development and extension of cropping systems with appropriate SFC components. 	<p>Means of Verification:</p> <ol style="list-style-type: none"> DOA records; Project evaluations; Site visits; Project audit; and Agro-socio economic studies. 	<p>Assumptions for achieving outputs:</p> <ol style="list-style-type: none"> Timing and quality of inputs to specifications; and AEARP and SCS projects proceed as planned. 																																																		
<p>Costs:</p>	<table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="2">Quantity (\$'000)</th> <th rowspan="2">TOTAL</th> </tr> <tr> <th>AID Grant</th> <th>GSL Loan</th> </tr> </thead> <tbody> <tr> <td>1. Technical Assistance</td> <td>3,115.4</td> <td>-</td> <td>3,115.4</td> </tr> <tr> <td>2. Training</td> <td>1,984.4</td> <td>-</td> <td>1,984.4</td> </tr> <tr> <td>3. Promotional Activities</td> <td>-</td> <td>2,078.9</td> <td>2,078.9</td> </tr> <tr> <td>4. Personnel</td> <td>-</td> <td>731.7</td> <td>731.7</td> </tr> <tr> <td>5. Operations & Maintenance</td> <td>-</td> <td>1,538.9</td> <td>1,538.9</td> </tr> <tr> <td>6. Evaluation</td> <td>125.0</td> <td>6.9</td> <td>131.9</td> </tr> <tr> <td>7. Social & Economic Research</td> <td>200.0</td> <td>-</td> <td>200.0</td> </tr> <tr> <td>8. Central Project Cost-sharing</td> <td>140.0</td> <td>-</td> <td>140.0</td> </tr> <tr> <td>9. Contingency</td> <td>333.9</td> <td>168.6</td> <td>502.5</td> </tr> <tr> <td>10. Unallocated</td> <td>1,964.2</td> <td>357.8</td> <td>2,322.0</td> </tr> <tr> <td>Total Project Costs</td> <td>11,400.0</td> <td>2,893.9</td> <td>14,293.9</td> </tr> </tbody> </table>		Quantity (\$'000)		TOTAL	AID Grant	GSL Loan	1. Technical Assistance	3,115.4	-	3,115.4	2. Training	1,984.4	-	1,984.4	3. Promotional Activities	-	2,078.9	2,078.9	4. Personnel	-	731.7	731.7	5. Operations & Maintenance	-	1,538.9	1,538.9	6. Evaluation	125.0	6.9	131.9	7. Social & Economic Research	200.0	-	200.0	8. Central Project Cost-sharing	140.0	-	140.0	9. Contingency	333.9	168.6	502.5	10. Unallocated	1,964.2	357.8	2,322.0	Total Project Costs	11,400.0	2,893.9	14,293.9	<p>Means:</p> <ol style="list-style-type: none"> Department of Agriculture budget; Project records and reports; and Project evaluations and audits. 	<p>Assumptions:</p> <ol style="list-style-type: none"> AID & GSL policies and priorities unchanged; and Budgets forthcoming as planned.
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5C(1) - COUNTRY CHECKLIST

Listed below are statutory criteria applicable generally to FAA funds, and criteria applicable to individual fund sources: Development Assistance and Economic Support Fund.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FAA Sec. 481; FY 1984 Continuing Resolution

Has it been determined or certified to the Congress by the President that the government of the recipient country has failed to take adequate measures or steps to prevent narcotic and psychotropic drugs or other controlled substances (as listed in the schedules in section 202 of the Comprehensive Drug Abuse and Prevention Control Act of 1971) which are cultivated, produced or processed illicitly, in whole or in part, in such country or transported through such country, from being sold illegally within the jurisdiction of such country to United States Government personnel or their dependents or from entering the United States unlawfully?

No.

2. FAA Sec. 620(c). If assistance

is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is not denied or contested by such government?

Not to the best of Mission knowledge.

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3. FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?
No.

4. FAA Sec. 532(c), 620(a), 620(f), 620D; FY 1982 Appropriation Act Secs. 512 and 513. Is recipient country a Communist country? Will assistance be provided to Angola, Cambodia, Cuba, Laos, Vietnam, Syria, Libya, Iraq, or South Yemen? Will assistance be provided to Afghanistan or Mozambique without a waiver?
No.

5. ISDCA of 1981 Secs. 724, 727 and 730. For specific restrictions on assistance to Nicaragua, see Sec. 724 of the ISDCA of 1981. For specific restrictions on assistance to El Salvador, see Secs. 727 and 730 of the ISDCA of 1981.
Not applicable.

6. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action of U.S. property?
No.

7. FAA Sec. 620(l). Has the country failed to enter into an agreement with OPIC? No.
8. FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5. (a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters? No.
- (b) If so, has any deduction required by the Fishermen's Protective Act been made?
9. FAA Sec. 620(q); FY 1982 Appropriation Act Sec. 517. (a) Has the government of the recipient country been in default for more than six months on interest or principal of any AID loan to the country? (b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the appropriation bill appropriates funds? No.
10. FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the amount of foreign exchange or other resources which the country has spent on military equipment? (Reference may be made to the annual *Taking into Yes.

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Consideration" memo:
"Yes, taken into account
by the Administrator at
time of approval of
Agency OYB." This
approval by the
Administrator of the
Operational Year Budget
can be the basis for an
affirmative answer during
the fiscal year unless
significant changes in
circumstances occur.)

11. FAA Sec. 620(t). Has the
country severed
diplomatic relations with
the United States? If
so, have they been
resumed and have new
bilateral assistance
agreements been
negotiated and entered
into since such
resumption?

No.

12. FAA Sec. 620(u). What is
the payment status of the
country's U.N.
obligations? If the
country is in arrears,
were such arrearages
taken into account by the
AID Administrator in
determining the current
AID Operational Year
Budget? (Reference may
be made to the Taking
into Consideration memo.)

The GSL is current.

13. FAA Sec. 620A; FY 1982
Appropriation Act Sec.
520. Has the country
aided or abetted, by
granting sanctuary from
prosecution to, any
individual or group which
has committed an act of
international terrorism?
Has the country aided or

No.

abetted, by granting sanctuary from prosecution to, any individual or group which has committed a war crime?

14. FAA Sec. 666. Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA?

No.

15. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device, after August 3, 1977? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.)

No.

16. ISDCA of 1981 Sec. 720. Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Session of the General Assembly of the U.N. of Sept. 25 and 28, 1981, and failed

Sri Lanka was not represented at the meeting when the communique was adopted,, and it entered written reservations subsequently.

to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the Taking into Consideration memo.)

17. ISDCA of 1981 Sec. 721.
See special requirements for assistance to Haiti. Not applicable.
18. FY 1984 Continuing Resolution.
Has the recipient country been determined by the President to have engaged in a consistent pattern of opposition to the foreign policy of the United States? No.

B. FINDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria
- a. FAA Sec. 116. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy? No.
2. Economic Support Fund Country Criteria
- a. FAA Sec. 502B. Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the country made such significant improvements in its human rights record that furnishing such assistance is in the national interest? Not applicable.

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b. ISDCA of 1981, Sec. 725(b). If ESF is to be furnished to Argentina, has the President certified that (1) the Govt. of Argentina has made significant progress in human rights; and (2) that the provision of such assistance is in the national interests of the U.S.?

Not applicable.

c. ISDCA of 1981, Sec. 726(b). If ESF assistance is to be furnished to Chile, has the President certified that (1) the Govt. of Chile has made significant progress in human rights; (2) it is in the national interest of the U.S.; and (3) the Govt. of Chile is not aiding international terrorism and has taken steps to bring to justice those indicted in connection with the murder of Orlando Letelier?

Not applicable.

5C(2) PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A. includes criteria applicable to all projects. Part B. applies to projects funded from specific sources only: B.1. applies to all projects funded with Development Assistance Funds, B.2. applies to projects funded with Development Assistance loans, and B.3. applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

Yes - An updated country checklist is included in the Project Paper

Yes.

A. GENERAL CRITERIA FOR PROJECT

1. FY 1982 Appropriation Act Sec. 523; FAA Sec. 634A; Sec. 653(b).

(a) Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the project;
(b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that amount)?

(a) By Congressional Notification.
(b) The assistance exceeds the amount included in the FY 1985 Congressional Presentation. However, the Congress will be notified of the proposed increase in project funding o/a June 10, 1984.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,00, will there be

(a) Yes
(b) Yes

(a) engineering, financial or other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

No legislative action is required.

4. FAA Sec. 611(b); FY 1982 Appropriation Act Sec. 501. If for water or water-related land resource construction, has project met the standards and criteria as set forth in the Principles and Standards for Planning Water and Related Land Resources, dated October 25, 1973? (See AID Handbook 3 for new guidelines.)

Not applicable.

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?

Yes.

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6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.

No. However, other donors are financing activities related to the project.

7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

- (a) Yes.
- (b) Yes.
- (c) No.
- (d) Yes.
- (e) Yes.
- (f) No.

8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

All technical assistance and the majority of training financed by the project will be provided through a contract with a U.S. firm. In addition, the major share of project-financed commodities and equipment will be procured from U.S. firms utilizing the services of a private U.S. procurement services agent. The U.S. private sector may also be enlisted to promote and assist in developing private sector seed production and marketing capabilities in Sri Lanka.

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9. FAA Sec. 612(b), 636(h);
FY 1982 Appropriation
Act Sec. 507. Describe
steps taken to assure
that, to the maximum
extent possible, the
country is contributing
local currencies to meet
the cost of contractual
and other services, and
foreign currencies owned
by the U.S. are utilized
in lieu of dollars.
- An estimated 31 percent of project costs
will be met by the GSL. No U.S. - owned
Sri Lanka rupees are available for project
use.
10. FAA Sec. 612(d). Does
the U.S. own excess
foreign currency of the
country and, if so, what
arrangements have been
made for its release?
- No.
11. FAA Sec. 601(e). Will
the project utilize
competitive selection
procedures for the
awarding of contracts,
except where applicable
procurement rules allow
otherwise?
- Yes.
12. FY 1982 Appropriation Act
Sec. 521. If assistance
is for the production of
any commodity for export,
is the commodity likely
to be in surplus on world
markets at the time the
resulting productive
capacity becomes
operative, and is such
assistance likely to
cause substantial injury
to U.S. producers of the
same, similar or
competing commodity?
- No. While production of agricultural
commodities is an objective of the project,
only marginal amounts are expected to
enter the export market and are highly
unlikely to be commodities in surplus on
world markets or to cause any injury to
U.S. producers.
13. FAA 118(c) and (d).
Does the project comply
with the environmental
procedures set forth in
AID Regulation 16? Does
- Yes. The project will promote sound
natural resource management, including wa er
shed and tropical forest protection and
conservation, through stabilization of
upland agriculture.

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the project or program take into consideration the problem of the destruction of tropical forests?

14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom)?

Not applicable.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(b), 111, 113, 281(a). Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and

(a) Approximately 512,000 small farm families (20 percent of Sri Lanka's population) are expected to benefit directly from increased income and employment through the adoption of low-cost improved farming technologies and increased use of improved seed. The farming systems approach to research and extension will assure that proposed technologies remain responsive to farmer needs and concerns and to market realities. Both rural and urban populations are expected to benefit over time from improved nutrition through increased consumption of grain legumes and animal protein. A variety of U.S. institutions will provide the major share of project inputs, including technical assistance and training.

(b) The project will assist in strengthening democratic private institutions at the local level, particularly in respect to production of subsidiary field crops under irrigated conditions.

(c) The project directly supports the GSL's desire to maximize food self-sufficiency and to provide increased income and employment opportunities to the rural poor as the country nears self-sufficiency in rice.

otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

b. FAA Sec. 103, 103A, 104, 105, 106. Does the project fit the criteria for the type of funds (functional account) being used?

c. FAA Sec. 107. Is emphasis on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)?

d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)?

(d) Farm women are expected to participate in and directly benefit from the project. Women members of the Department of Agriculture and social science institutions will also benefit from long- and short-term training and technical assistance under the project.

(e) Training will utilize regional institutions, including the International Agricultural Research Centers, and increased intra-regional trade is anticipated over the longer term as increased quantities of subsidiary field crops enter the export market.

Yes.

Yes. The project will emphasize low-cost production technologies appropriate to small farmers in the project areas.

Yes. The GSL will contribute an estimated 31 percent of total project costs.

e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"? (M.O. 1232.1 defined a capital project as "the construction, expansion, equipping or alteration of a physical facility or facilities financed by AID dollar assistance of not less than \$100,000, including related advisory, managerial and training services, and not undertaken as part of a project of a predominantly technical assistance character."

Not applicable.

f. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?

Yes. The project will contribute to increased small farmer income and employment and to foreign exchange earnings/savings through import substitution and the development of subsidiary field crops-related agro-industries.

g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage

The project responds to small farmer needs for increased income and employment, the need to redress deteriorating nutritional status among rural and urban populations, and will capitalize on the Sri Lankan farmer's demonstrated capacity to innovate.

The project is essentially an institutional building effort designed to strengthen the capability of the Department of Agriculture to program and carry out sound agro-climatological and farmer-relevant research, effectively transfer new and adapted technologies to farmers, and ensure the supply of quality subsidiary field

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institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government.

crop seed. The project will promote and support private sector participation in the production and marketing of commercial seed.

Development Assistance Project
Criteria (Loans Only)

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, at a reasonable rate of interest.

The Government of Sri Lanka is current on its international obligations, and no problem is anticipated in regard to repayment of this loan.

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

Not applicable.

c. ISDCA of 1981, Sec. 724 (c) and (d). If for Nicaragua, does the loan agreement require that the funds be used to the maximum extent possible for the private sector? Does the project provide for monitoring under FAA Sec. 624(g)?

Not applicable.

3. Economic Support Fund
Project Criteria

Not applicable.

a. FAA Sec. 531(a). Will this assistance promote economic or political

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stability? To the extent possible, does it reflect the policy directions of FAA Section 102?

- b. FAA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary activities? Not applicable.

- c. FAA Sec. 534. Will ESF funds be used to finance the construction of the operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such use of funds is indispensable to nonproliferation objectives? Not applicable.

- d. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made? Not applicable.

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 வெளிநாட்டு வள நிர்வாகங்கள்
 திணி, திட்டமிடல், உணர்ச்சு
DEPARTMENT OF EXTERNAL RESOURCES
 Ministry of Finance and Planning

දේශීය ආදායම් මොඩිනැලිල්ල (15 වන මහල)
 உள்ளநாட்டினறவரிக் கட்டிடம், (15வது மாடு)
 Inland Revenue Building (15th Floor)
 කැ. පෙ. 277, කොළඹ 2
 க. பெ. இல. 277, கொழும்பு 2
 P. O. Box 277, Colombo 2
 3 July, 1984.

Mr. Frank D. Correl,
 Director, USAID,
 American Embassy,
 Colombo 3.

Dear Mr. Correl,

Re: Diversified Agriculture Research

On behalf of the Government of Sri Lanka we wish to make a formal request for USAID assistance in undertaking a project for Diversified Agriculture Research.

The project as currently designed is intended to (a) strengthen research (both agronomic & socio-economic) on coarse grains, grain legumes and oil crops with emphasis on an integrated, multi-disciplinary farming system approach to research and extension; (b) improve technology transfer through the extension and education/training systems; (c) improve seed production & distribution, including an expanded role for the private sector in the production and marketing of certified seed; and (d) strengthen agriculture sector management capability.

The main components of the project as jointly identified by the Government of Sri Lanka (GOSL) and USAID will include: long & short-term training, including in-country training at the Post Graduate Institute of Agriculture; technical assistance; commodities (laboratory, farm and seed processing equipment, vehicles); construction and renovation of facilities (laboratories, seed processing and storage facilities, staff quarters); new staff; increased operating budget; evaluation; project workshops; and economic and social research. This assistance will be provided to the Department of Agriculture headquarters in Peradeniya, seven regional research centres, extension facilities and in-service training institutes in the project area, five seed processing centres, four seed farms and private seed growers & marketers.

The total cost of the project is estimated at approximately \$ 16.560 million. Of the total cost, we request USAID assistance to the extent of \$ 11.4 million (\$ 7.9 million as a grant & \$ 3.5 million as a loan) to be made available over an 8 year period. The balance funds required for the project, amounting to approximately

Rs. 126.5 million is expected to be contributed by the Government of Sri Lanka. The GOSL contribution will be made available in a timely manner over the life of the project and depending on the resources available to the Government. Within the ambit of the Public Investment Programme every effort will be made to assign due priority to this project in the allocation of rupee counterpart funds in the amount, and at the time, needed.

We shall be grateful if you would obtain the formal concurrence of your authorities for the authorization of USAID support requested for the project.

Sincerely Yours



(M.A. Mohamed)
Director of External
Resources

1/-

UNITED STATES OF AMERICA
AGENCY FOR INTERNATIONAL DEVELOPMENT
44, Galle Road, Colombo 3, Sri Lanka.

Certification Pursuant to Section 611 (e) of
the Foreign Assistance Act of 1961, as amended

I, Frank D. Correl, Director of the Agency for International Development in Sri Lanka, having taken into account, among other things, the capacity of the Sri Lanka Government and its agencies to properly utilize and maintain the facilities to be constructed and the commodities to be imported under this project as well as the technical assistance and training to be funded, do hereby certify that, in my judgement, Sri Lanka has both the financial capability and adequate human resources to effectively utilize the inputs provided by this project.

This judgement is based upon the project analyses presented in the Diversified Agriculture Research Project Paper and is subject to the conditions imposed therein.



Frank D. Correl
Mission Director

Date: August 9th 1984

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR FOR ASIA

FROM : Frank D. Correl, Director, USAID/Colombo

SUBJECT : Sri Lanka - Diversified Agriculture Research Project No. 383-0058
(Loan No. 383-T-033) - Request for Vehicle Procurement Source/
Origin Waiver

Problem: Your approval is requested for a source/origin waiver from AID Geographic Code 000 (U.S. only) to Geographic Code 935 (Special Free World) to permit procurement of 10 passenger vehicles, 43 motorcycles, and nine four-wheel drive, double cab pick-up trucks for use in the subject project.

- A. Cooperating Country: Sri Lanka
- B. Authorizing Document: Project Authorization to be signed o/a
June 15, 1984
- C. Project: Diversified Agriculture Research Project
No. 383-0058
- D. Nature of Funding: Loan (Section 103)
- E. Description of Commodities: Ten passenger vehicles, forty-three 100-
125 cc motorcycles, and nine four-wheel
drive, double cab pickup trucks. All, except
motorcycles, will be diesel powered and righthand
drive.
- F. Approximate Value: \$130,300
- G. Probable Procurement Origin: Japan, Germany
- H. Probable Procurement Source: Sri Lanka, Japan, Germany

Discussion: Section 636 (1) of the Foreign Assistance Act of 1961, as amended, provides that none of the funds made available to carry out the Act shall be used for the purchase of motor vehicles unless such motor vehicles are manufactured in the United States. Section 636 (1) does provide, however, that "...where special circumstances exist, the President is authorized to waive the provisions of this Section in order to carry out the purposes of this Act." Under delegated authority, Assistant Administrators may waive this restriction under certain circumstances. As set forth in AID Handbook 1, Supplement B, Section 4C 2d(1), these circumstances are deemed to exist if, inter alia, there is an "inability of U.S. manufactures to provide a particular type of needed vehicle; e.g., light weight motorcycles, righthand drive vehicles."

The Government of Sri Lanka (GSL) has requested AID assistance in increasing the production of subsidiary field crops. This is to be achieved by strengthening the institutional capability of the Department of Agriculture (DOA) to generate and transfer technologies and seed required to increase and

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sustain production on small farms. The subsidiary field crops (SFC) represent a major new GSL initiative after years of focussing largely on rice production. The crops are grown throughout the dry and intermediate zones covering 77 percent of Sri Lanka's total land area. As described in the Project Paper, DOA staff in the five participating DOA divisions are vastly under-supported in a number of critical areas including transportation. It is essential to project success and to the success of the GSL's subsidiary field crop program that Department and other project personnel, including new multidisciplinary farming systems research teams, and technical assistance advisors be provided with the means to move among widely separated research stations; extension and training facilities, seed production/processing facilities and SFC producers' farms. Transportation needs were carefully analysed by the project design team and further refined by USAID/Sri Lanka and the Department of Agriculture. The resulting list of vehicles proposed for project financing reflects, in our collective judgment, minimum essential requirements to effectively support the new A.I.D. project and GSL program in SFC production.

The ten righthand drive sedans are for use by DOA personnel and short- and long-term consultants for transport between DOA headquarters in Peradeniya and 12 far-flung research and seed facilities, and between the facilities themselves. Sedans will also be used for transportation to and from Colombo where the Ministry of Agricultural Development and Research, USAID, and other project-related institutions such as the Agrarian Research and Training Institute are located. For reasons of safety, it is essential that vehicles procured under the project be righthand drive since all traffic in Sri Lanka moves on the left side of the road. There are no righthand drive sedans manufactured in the U.S. There are, however, righthand drive sedans manufactured in other Code 935 countries for which there are adequate spare parts and maintenance facilities in Sri Lanka.

The nine four-wheel drive, double cab pickup trucks are for use by the Seed Division, which requires easy access, load-carrying capacity (primarily for bagged seeds and fertilizers, and plant protection equipment) combined with four to six passenger capacity for use at the five DOA seed processing/storage centers and four seed farms and in work with private seed growers. The U.S. does not manufacture righthand drive vehicles of this description. However, righthand drive vehicles of this type of Japanese origin, for which spare parts and servicing are readily available, are in common use throughout Sri Lanka.

The 100-125 cc motorcycles are for use by field staff of the Department assigned to the research and seed components of the project for transport between DOA facilities and (a) small farms involved in various research elements of the project and, (b) private seed growers. A light weight motorcycle, readily serviceable in-country, is ideally suited for this purpose. The U.S. does not manufacture light weight motorcycles. However, light weight motorcycles of Japanese manufacture are available for immediate purchase in Sri Lanka, an eligible source under the terms of the Project Authorization. Spare parts and servicing are also readily available in-country.

Title to all of the foregoing vehicles will be held by the Department of Agriculture, whose contributions to the project include vehicle operation (fuel and drivers) and maintenance. Fuel costs for the five passenger vehicles to be assigned to the long-term technical advisors will be funded by AID through the technical assistance contract.

Recommendation: Based on the justification above, it is recommended that you (1) determine that special circumstances exist to justify waiving the requirement to procure U.S. manufactured vehicles under FAA Section 636 (1), (2) approve a source/origin waiver from AID Geographic Code 000 to Code 935; and, (3) certify that exclusion of procurement of the above described project vehicles from Free World countries other than the cooperating country and countries included in AID Geographic Code 941 would seriously impede attainment of U.S. foreign policy objectives and the objectives of the foreign assistance program.

Approved: _____

Disapproved: _____

Date: _____

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ANNEXES, CON'T.

ANNEX B. TECHNICAL ANNEXES

ECONOMIC ANALYSIS

The basic economic premise on which the project is based is that Sri Lankan agriculture will have to diversify in the face of coming rice self-sufficiency in order to remain profitable. As discussed more fully in the technical analysis, the rice produced in Sri Lanka will not find international markets, and it is recommended that Sri Lanka not even attempt to enter the rice export market. Given this, crop diversification is the only reasonable alternative. The following analysis discusses SFC marketing issues and presents a rate of return analysis for the project

The question of markets and marketing of SFC will be an important area for the project due to the number of crops involved, the size of the potential increases in output, and the number of potential markets. Major considerations related to marketing of the SFC can be cast in the context of three issues:

- The existence of (potential) effective demand for these crops, both domestic and external;
- The role of government policy to affect producers' and consumers' perceptions and decisions relative to these crops; and
- the efficiency and foresight with which this effective demand is exploited through an appropriate marketing strategy.

Some markets (e.g., in export) will need to be discovered; others (e.g., domestic) will need to be developed. The discussions presented earlier have shown that substantial potential demand exists for many of the SFC. This potential demand is both domestic and external. The domestic users are final consumers and industrial users (including the livestock industry). Domestic demand will continue to grow for many of the crops as long as personal real income and population grow. There will need to be a substantial rise in per capita income before large number of consumers shift to more preferred food sources, e.g., livestock products.

Steps to improve marketing of the SFC through better product handling, quality standardization, maintaining reliable export supply, and creating more value-added through, say, preliminary processing, might be an important component of the market potential for these crops. Improved quality and more reliable quantity of production will facilitate export marketing, e.g. of sesame.

The private sector has demonstrated the capacity to efficiently and effectively handle rice marketing (before 1977 the exclusive preserve of the Paddy Marketing Board.) There is no reason to expect that this will not be the case for the SFC, since handling and the storage characteristics are similar. Also, it is a government policy to develop the livestock industry, and producers themselves are important consumers of the SFC. Additionally, a reduction in cost of production through higher yields should result in lower prices and increased demand at the same time that the farmer gains from increased volume of output per unit of land.

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Finally, a recent marketing study* concluded that marketing problems will not be a major bottleneck to expansion of SFC production. The proportion of SFC production entering market channels in the principal growing areas in the Maha season generally exceeds 80 percent, and the market structure appears to be reasonably efficient, with a high degree of competition among traders. Traders have fair access to price information, and the entry of new traders into the market is relatively unrestricted. An analysis of trader margins shows that producers generally receive a very high share of the final wholesale price---in many cases more than 80 percent.

Precise demand projections for SFC are impossible to make due to poor data and extreme fluctuations in annual production. Future demand will be a function of the rate of population and real income growth, the size of the income and price elasticities of demand, consumer preferences and export market potentials.

The market potential for the crops considered under this project is generally good. In the case of maize and green gram, Sri Lanka is a net importer, so that increased production will yield foreign exchange savings. Cowpea is a generally acceptable substitute for imported dahl, so that increased production will enter that marketing stream.

Black gram, ground nuts and sesame are all presently exported, and soybean oil and powder are increasingly being used as substitutes for coconut oil and milk. Recent studies indicate that the primary constraint on SFC export is quality and reliability of production, both of which are to be addressed by this project.

The question of exploring and exploiting the above market potentials and influencing the role of relevant government policies on price subsidies and import liberalization are areas too broad to be adequately handled by this project. They will, however, be closely monitored during project implementation. Specific short-term marketing problems will be addressed through a series of economic studies carried out by or through the Division of Agricultural Economics and Projects.

Evidence exists to show that investment in agricultural research, when adequately funded and properly guided, is highly profitable relative to alternatives. Ex-post economic cost-benefit analyses of research have revealed consistently high internal rates of return (IRR). In Mexico, the return was 35 percent for maize research, 90 percent for wheat, and 45-93 percent for all crops combined. In Brazil, the return to research on cotton was greater than 77 percent; in Colombia, the return was even higher. Similarly, the IRRs for combined research and extension have been quite high -- 34-44 percent in India, for example.* And, although no ex-post economic analysis has been undertaken on rice research expenditure in Sri Lanka, as mentioned earlier it is clear that the impact on yields has been quite high.

* See Agroskills Ltd., "Subsidiary Food Crops Marketing Study", Colombo, October 1983.

** See for example, Robert E. Evenson, Paul E. Waggoner and Vernon W. Ruttan, "Economic Benefits from Research: An Example from Agriculture," "Science", Vol. 205, September 1979.

The quantitative economic analysis of the project rests on two basic premises:

- a) The project will be instrumental in strengthening the DOA's capacity to develop technologies that will substantially increase the yields of many SFC; and,
- b) The demand to absorb the increased output at current prices exists and will continue to expand, thus maintaining adequate producer prices. The total yearly outputs incorporated in this analysis fall within the projected demand ranges for corresponding years.

Further, the following data and additional assumptions are used:

- Project life will start in 1985 and end in mid-1992. Benefits are calculated through the year 2000.
- The project will particularly emphasize, at least in the early stages, the following crops: cowpea, black gram, green gram, sesame and maize.
- Displacement of rice by SFC in some areas will be offset by some upland (marginal SFC land) being abandoned for grazing and/or forests. Thus, it is conservatively assumed that overall area in SFC will remain constant.
- No major changes will take place in relative prices due to changes in consumer preferences or government policies.
- Without the project, yields for the target crops will, on the average, increase by 2 percent annually. (Out of the eight crops considered, four actually increased in yield by about 3 percent annually over the past dozen years, while the others showed an average increase of 1 percent.) This is not unrealistic given that improved inputs and projects such as the Mahaweli Scheme would have contributed to such an increase.
- With the project, no improvement in yield is expected for the first three years of project life other than the rate assumed for the "without project" scenario. For cowpea, black gram, green gram, sesame and maize, beginning in 1988, yield increases of 5 percent per annum are projected through 1992, after which the rate of increase goes up to 6 percent until the year 2000. For groundnut, soybean and finger millet, results will

be available in 1990 which will result in 5 percent per year growth for two years, followed by 5 percent a year growth from 1992-2000. These rates are not unrealistic, as most of these crops start from a very low base. (For most SFC, their yields can increase at 10 percent per year for 10 years before they approach the experimental yield rates.)

- Of the total improvement in yield from the "with project" scenario, only 40 percent is ascribed to the project; the remainder is assumed to come from improved and increased inputs, e.g., labor, credit.
- A shadow rate of exchange of U.S. \$1 = Rs.27 is used.

Combining the above information and using 1983 SFC market prices, the internal rate of return (IRR) for the project is 26.6 percent.* There are a number of reasons why this might be highly undervalued. One is that institution building is the major goal of the project and, to the extent that the benefits from such institution building are diverted to other non-SFC activities, the economic analysis does not account for such benefits. Another source of much undervaluation is the fact that benefits from rice and the remaining SFC have not been included. The project will provide some continued support for rice research maintenance, but the economic analysis deals only with eight SFC (cowpea, black gram, green gram, soybean, sesame, groundnut, maize and finger millet). Also, the analysis does not consider the salvage values of the research output technology nor the institution building after the year 2000. Finally, the value of the project in expanding employment and income, and improving nutritional adequacy, are not taken into economic consideration.

* Detailed calculations of the IRR are on file in USAID/Colombo

SOCIAL SOUNDNESS ANALYSIS

1. Introduction

The Diversified Agriculture Research Project is primarily an institution building effort designed to upgrade the capability of the Department of Agriculture to promote increased and sustained subsidiary field crop production on small farms. The purpose of this analysis is to examine the feasibility of the proposal from a socio-cultural perspective, particularly vis à vis the target group of small-scale farmers in the dry and intermediate zones. Highly disaggregated social and economic data do not exist for this group at the district level and below. This analysis relies on a variety of published and unpublished studies and reports, and on the findings of a series of random interviews of small farmers conducted by the project design team in late 1983, to develop a preliminary social profile of the target group. The collection of more precise socio-cultural and economic data will be a key activity under the project, and will serve a number of purposes including input into research programming and technology transfer, and measurement of project impact. Because of its emphasis on a farming systems approach, drawing on both the technical and social sciences to identify and address constraints to increased productivity, the project by its very nature provides for testing social soundness throughout implementation.

There follows a brief description of agriculture in the dry and intermediate zones; an overview of the target group together with data on the rural population as a whole; an assessment of feasibility and potential future constraints; and, finally, a discussion of target group and charge agent participation, expected project benefits, and spread effects.

2. Agricultural Overview, with Emphasis on the Dry and Intermediate Zones

Sri Lanka's surface area is distributed unevenly among three major climatic zones. The wet zone, which covers the southwest coast and most of the central mountains, is characterized by average annual rainfall of between 100 and 200 inches distributed throughout the year. The dry zone, comprising the entire central plain of the north plus the eastern coastal belt extending from Hambantota to Batticaloa, has average annual rainfall of less than 35 inches, and distinct and prolonged dry periods (often 6-8 months in duration). The intermediate zone, lying between the wet and the dry zones, is generally characterized by average annual rainfall of less than 60 inches. The dry and intermediate zones together - the project area - contain 77 percent of the country's total land area, 45 percent of the population, and 44 percent of all land under permanent cultivation. Table 1 shows the relationship between land area, population, and extent of development for the three zones.

Table 1: Land Area, Population & Development by Zone

Climatic Zone	Acreage (Million)	% Total Area	% Population	% Developed land	Developed land use land as % of total developed land in Sri Lanka
Wet	3.8	23.2	55	70	56
Intermediate	2.2	3.3	20	49	17
Dry	10.3	63.5	25	11	27

Source: Sri Lanka Country Study on Rural Employment Promotion (Geneva: ILO 1975). "Developed" = permanent cultivation, including plantations.

Land utilization in the dry zone is limited by the distribution and unreliability of rainfall; the intermediate zone has limitations of this nature, too, but to a lesser extent.

Land use, based on both highly diverse agroclimatic and sociocultural factors, is of two major types: shifting cultivation, and some permanent system of farming. Pastoralism exists on a relatively minor scale confined to the eastern shore. Shifting cultivation is the principal type of land use in the well-drained soils (uplands) of the dry and intermediate zones. The lowlands are cultivated in a permanent (paddy rice) system of farming which has supported dense populations over many centuries. Further examples of settled agriculture are the tea and rubber plantations and spice gardens, nearly 75 percent of which are found in the wet zone.

Paddy cultivation occurs on 30 percent of the cultivated land. Though grown widely, rice does best in the dry zone under well-regulated and assured irrigation; the dry and intermediate zones together account for two-thirds 2/3 of the rice grown in the country. In the dry zone, which contains nearly 80 percent of all irrigated land, 75 percent of the rice is irrigated. The supply of irrigation water, however, is often inadequate and uncertain.

Paddy cultivation is characterized by a large number of smallholders. Two-thirds of the country's operators have holdings of less than one acre; more than one-third have holdings smaller than 0.5 acre. The vast majority of these smallholders in the dry and intermediate zones augment their operations through the inclusion of homegardens and/or subsidiary field crops under shifting (or, less frequently, stable) cultivation.

Crop production in the project area is based on a traditional three-fold pattern of land use which has persisted throughout the centuries. The nucleus of this system is the "tank" or reservoir, below which lie the paddy lands.* Adjacent to the paddy lands are the village homesteads (used primarily for horticulture); the surrounding areas above the tank (known as the uplands, highlands or "chenas") are where the bulk of the SFC are produced.

The uplands, by and large are cultivated under rainfed conditions, and may be planted to crops such as finger millet, cowpea, soybean, greengram, groundnut, maize, sesame, chillies, onions and other vegetables, and upland rice. Home gardens are normally planted to perennials such as coconuts and bananas plus cassava and other vegetables, and may include small extents of subsidiary field crops. Farms may also contain one or more kinds of livestock which constitute an important part of the economy and life style in parts of the project area (the dry zone alone is estimated to contain 75 percent of the country's cattle, buffalo, sheep, and goats).

As tables 2A and B show, the common denominator of dry and intermediate zone agriculture continues to be paddy, with over half of all cultivators farming paddy alone or in combination with other crops. The same tables show that upland (SFC) crops are more variable, depending upon market demand and upon local rainfall levels and patterns. The traditional working and cropping pattern has been (1) to begin highland cultivation and planting with early Maha (NE monsoon, October-December) rains; (2) to prepare paddy fields, usually after the tank has filled, using tank water to facilitate cultivation of the heavier lowlands soils; (3) to grow a Yala (SW monsoon, April-July) paddy crop, usually on a reduced area of the tank-irrigated land, if sufficient water remains after its use for paddy preparation and irrigation during the Maha; and, (4) to grow a Yala upland crop if rainfall permits. The typical dry zone farmer, therefore, grows a variety of crops and has to constantly deal with a number of production options and resource allocation problems, depending on input prices, weather patterns and market conditions.

3. The Target Group

The target population for the project according to the 1982 Agricultural Census (preliminary report), are the approximately 910,000 small holder families (5 million people) in the dry and intermediate zones. They are

* Some of the tanks in major irrigation schemes (the major tanks) have been rehabilitated and re-settled with colonists". The minor tank settlements by contrast are the traditional villages which have persisted from ancient times to the present.

TABLE 2B: CROPPING PATTERNS IN SRI LANKA, YALA SEASON 1982
 Percentages of District Field-cropped Area, and of Country-Wide Area for Different Crops

District	Total acreage Paddy + S.F.C.	Paddy		Cowpea		Green gram		Black gram		Sesame		Soya-bean		Maize		Chillies		Red Onion		Bombay Onion		Groundnut		Finger millet		Manioc		Sweet Potato		Other S.F.C.				
		I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II			
Jannar	517	53	*	0	0	2	*	0	0	6	*	0	0	0	0	16	*	6	*	1	2	7	*	0	0	5	*	3	*	0	0			
Trincomalee	22,542	91	3	*	*	*	*	*	1	1	*	0	1	0	0	2	2	1	3	0	0	*	1	0	0	2	1	*	1	*	*			
Anuradhapura	40,603	20	1	1	2	*	1	1	30	72	41	2	28	0	0	2	3	*	*	0	0	0	0	0	0	0	0	0	0	0	0			
Hambantota	41,619	84	5	2	3	1	2	0	0	1	1	0	0	0	0	5	6	*	*	0	0	2	11	0	0	1	2	*	2	3	7			
Vavuniya	3,580	25	*	7	1	1	*	0	0	24	1	*	*	0	0	7	1	17	6	0	0	9	4	0	0	9	1	*	*	0	0			
Mullaitivu	7,735	45	1	*	*	1	*	0	0	*	*	*	*	0	0	26	6	20	14	*	6	6	6	0	*	*	*	1	*	*	*			
Jaffna	35,748	49	3	1	1	1	2	*	6	*	*	*	2	*	*	26	28	17	58	*	53	*	2	2	22	2	2	*	1	*	*			
Colonnarua	44,999	90	6	1	1	1	3	0	0	*	*	1	8	0	0	3	4	*	*	*	3	3	15	*	*	*	1	*	0	0	0			
Natticaloa	26,446	83	3	*	*	*	*	*	2	*	*	0	0	0	0	2	2	1	2	0	0	*	1	0	0	13	16	*	*	0	0			
Puttalam	26,490	27	1	25	20	8	10	1	12	29	11	0	0	0	0	2	2	0	0	*	19	2	8	*	1	5	4	1	3	*	*			
Moneragala	20,651	51	1	12	8	2	2	0	0	14	4	*	2	2	28	*	*	*	*	*	*	4	10	*	3	1	1	*	*	13	16			
Ampara	65,192	95	9	1	2	1	3	0	0	*	*	1	0	0	*	*	*	*	0	0	0	0	0	0	0	0	2	4	*	3	0	0		
Badulla	24,192	45	2	4	3	3	3	*	5	3	1	*	4	*	6	3	2	2	4	0	0	3	9	2	22	6	4	2	8	26	36			
Katale	22,038	43	1	3	2	2	2	*	2	14	4	1	10	0	0	30	20	*	*	9	1	2	0	0	3	2	1	3	1	1	1			
Murunegala	168,197	65	16	9	46	8	65	*	39	14	34	*	5	0	0	2	11	*	1	0	0	1	20	*	1	0	0	0	0	0	0			
Kalaweva	13,738	48	1	20	9	1	*	*	*	0	0	9	35	0	0	21	9	*	*	0	0	0	0	0	0	0	0	0	0	0	0	0		
Udawalave	26,838	96	4	*	*	*	1	*	0	1	*	0	0	0	0	1	1	*	*	0	0	*	2	*	2	*	*	0	0	0	0			
Sub Total	591,125	66	57	5	99	3	97	*	100	22	99	*	97	*	34	5	98	2	91	*	93	1	92	*	50	2	32	*	23	2	60			
Nowara Eliya	13,240	75	1	1	*	*	*	0	0	*	*	1	2	1	5	3	1	4	5	*	7	*	1	1	6	7	3	21	2	5	5			
Ratnapura	43,690	85	5	*	*	*	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	1	2	2	2		
Colombo	15,563	94	2	*	*	0	0	0	0	0	0	0	0	0	0	0	0	*	*	0	0	*	*	*	*	0	0	0	0	0	0	0		
Gampaha	27,612	99	4	*	*	*	*	0	0	0	0	0	0	0	0	0	0	*	*	0	0	0	0	0	0	0	5	8	2	19	2	7		
Natara	51,045	90	7	0	0	*	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	43	1	2	1	4	*	1		
Kandy	40,612	91	5	1	1	*	1	*	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	1	10	1	4		
Galle	52,822	96	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	38	1	13	0	0
Kalutara	57,635	76	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	9	1	6	5	8	
Negalle	31,713	84	4	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Sub Total	333,932	88	43	*	1	*	3	*	*	1	*	3	*	66	*	2	*	8	1	7	*	8	*	49	7	68	1	77	2	38	38			
Total acreage Sri Lanka	925,057	684,318	32,519	19,963	1,380	70,321	3,399	1,423	32,867	10,634	305	7,855	2,704	34,157	5,986	17,125																		

Col. I: Cropwise area as percentage of district field-cropped area.
 Col. II: Cropwise area as percentage of Sri Lanka area for this crop.

* Less than 0.5%
 0 Not cultivated.
 - Not reported

Source: Division of Agricultural Economics, Department of Agriculture. Provisional figures.

Note: Districts are listed in order of decreasing average rainfall, except for the recently-formed Kalaweva and Udawalave districts in the dry/intermediate (first) group. Mullaitivu is listed after Vavuniya, from which it was recently formed.

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ethnically and religiously diverse, and their patterns of land tenure and farm structure vary widely. Of the total, 120,000 families (13 percent) own no land, but operate other peoples' lands (primarily highland and paddy) as tenant farmers. A further 278,000 (30 percent) own home gardens only. The balance 512,000 families (57 percent) own farms which include paddy and upland, and may include home gardens. The target group includes both inhabitants of traditional villages as well as the colonists in the major new irrigation areas, of which the Mahaweli is the foremost example.

Size of holdings range from a quarter acre or less for a home garden, to 20 acres, as shown in Table 3 below.

Table 3: Number and Total Extent of Holdings by Size
('000 acres)

	Less than 1	1-2	2-3	3-20	Total
No. of Holdings	287.6	186.8	148.9	284.9	908.1
Area in Acres	109.1	235.3	328.0	1,523.5	2,196.0

Source: 1982 Census of Agriculture

According to one study, there were 616,399 acres under subsidiary field crops in 1976, of which 221,990, or 36 percent, were on holdings of less than 1/2 acre and 164,824, or 27 percent, were on holdings of 1/2 to one acre.

Annual per capita income among the target population is low, rarely exceeding \$260, and will vary depending on, inter alia, extent of paddy cultivation, size of holdings, value of non-paddy crops grown, and amount of off-farm income. Income from subsidiary field crops varies widely. A study of SFC production published in 1982 shows that average household incomes from coarse grains and grain legumes in the five districts studied ranged from Rs. 324 (\$13) in Badulla, to Rs. 8,930 (\$360) in Chettikulam*.

The study also concluded that farmers without paddy were the most disadvantaged despite income from off-farm work. "Unless an economically efficient and stable rainfed farming system on highland which can stand

* T. Sanmugam & S. M. P. Senanayake "Prospects for Expansion in the Production of Coarse Grains and Grain Legumes," Agrarian Research & Training Institute, Colombo, 1982.

on its own and even compete with a system including paddy land can be developed, the economic and social conditions of pure highland and chena cultivators will continue to be economically inferior."*

Both of Sri Lanka's two main ethnic groups, the Tamils and Sinhalese, are well represented among the target population. Of the island's total population, the Sinhalese constitute 74 percent and Tamils 18 percent, but these proportions vary considerably according to geographical regions. The map on page 8 shows that of the 15 districts in the dry and intermediate zones, six are predominantly Tamil and nine predominantly Sinhalese. The former are located in the Northern areas and along the Eastern coast, while the latter are concentrated in the Central and Southern areas.

Table 4 - Ethnic Composition in the Project Area

Ethnic Group	Total No.	Distribution
Sinhalese	3,986,759	62.8
Tamils	1,738,152	27.4
Moslems	598,762	9.4
Other (Burghers, Malays, etc.)	25,123	0.4
Total	6,348,796	100

(Based on 1981 Population & Housing Census.)

Both major ethnic groups have a long-standing tradition as farmers, and to the same degree as Sinhalese farmers have shown great progress in rice farming, so have Tamil farmers in the cultivation of chillies, potatoes and onions. Both groups are equally innovative or responsive to production incentives. Nevertheless, ethnic cum religious factors do influence agriculture and the potential for change. Buddhists in rural areas are largely vegetarian, while Hindus do not consume beef. As a result, prospects for a profitable combination of animal husbandry with market gardening may be significantly circumscribed in some areas.

Tensions between Sinhalese and Tamil communities exist, erupting from time to time in violence as they did in August 1977 and again in July 1983. While communal tensions remain a serious socio-political problem, they are not expected to materially affect the project. Unlike other projects, moreover, which have benefitted one community over another, this project should have favorable consequences for ethnic equity as well as for economic and geographic equity.

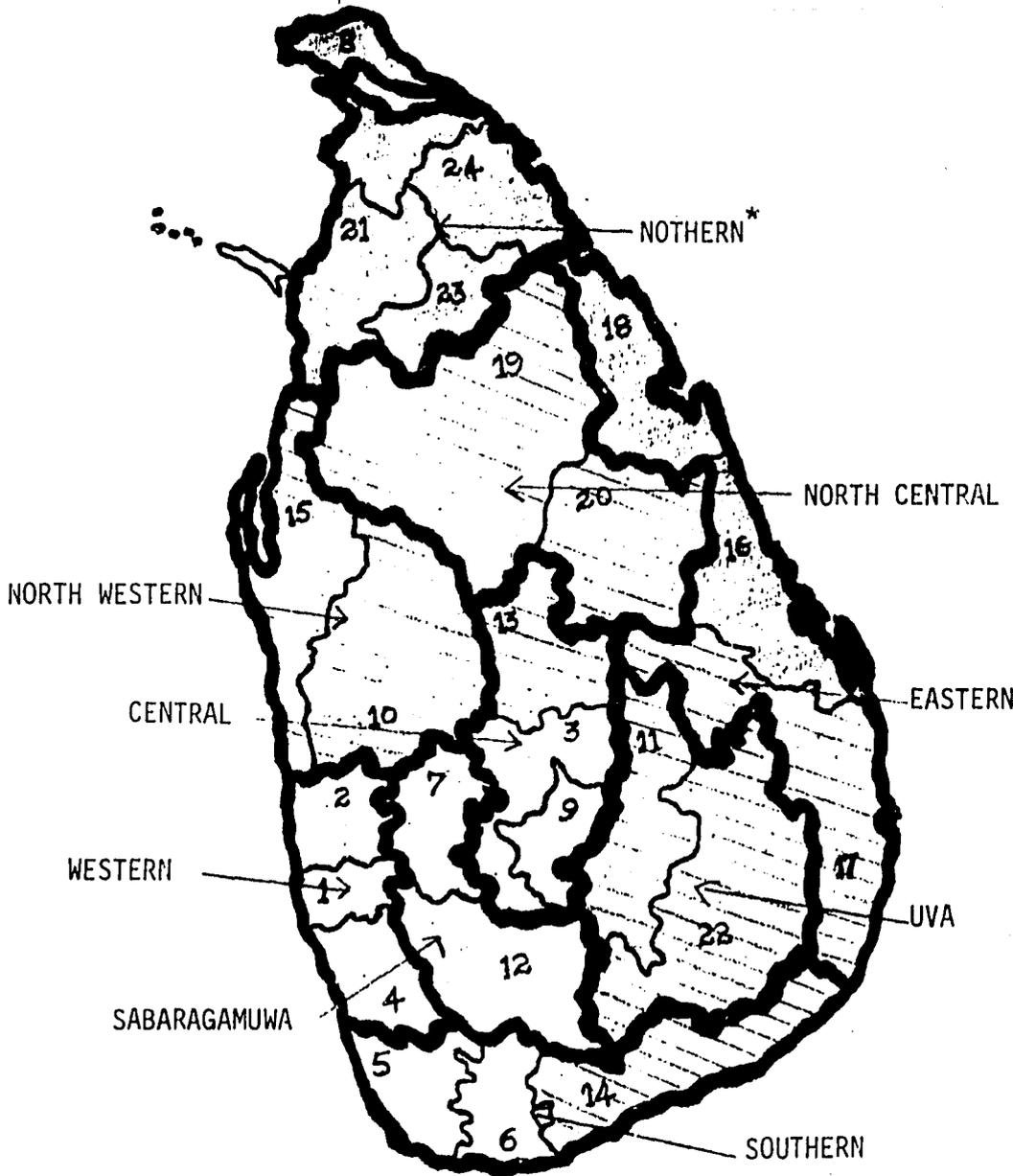
* Ibid., page 51.

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ETHNIC CHARACTERISTICS OF PROJECT AREA
(DRY AND INTERMEDIATE ZONES)

Administrative Districts

1. Colombo
2. Gampaha
3. Kandy
4. Kalutara
5. Galle
6. Matara
7. Kegalle
8. Jaffna
9. Nuwara Eliya
10. Kurunegala
11. Badulla
12. Ratnapura
13. Matale
14. Hambantota
15. Puttalam
16. Batticaloa
17. Amprai
18. Trincomalee
19. Anuradhapura
20. Polonnaruwa
21. Mannar
22. Moneragala
23. Vavuniya
24. Mullaitivu



- * Provinces
- Administrative Boundaries
- Provincial Boundaries
- ▨ Predominantly Tamil Districts
- ▩ Predominantly Sinhalese Districts

In terms of population growth rate and density, in the decade 1971-1981 the rural population in the dry and intermediate zones grew at a substantially higher rate (32 percent) than the rural population in the wet zone (16 percent). While population density in the project area is less than in the wet zone (with the exception of Jaffna District), this fact tends to obscure the dynamic process occurring in the project area over the past several decades. The resettlement of farmers in newly opened or rehabilitated areas of the dry zone has been the principal means by which the GSL has sought to accommodate excess population from the wet zone. In addition to these official settlements, a considerable amount of illegal encroachment in the uplands of the dry zone has been taking place. These processes have resulted in a substantial increase in the size of the dry zone population, underscoring the need for both an expansion of agriculture, as the principal source of economic activity, and an increase in food production.

Population density and increase have important implications for farming systems and soil and water conservation practices. At a time when the population in the dry zone was sparse, shifting cultivation could be maintained in balance with the environment. Over the past 10 years, however, the increase in population pressure coupled with increased production of cash crops has resulted in restorative fallows becoming eliminated. These developments over time will have adverse consequences for soil conservation and fertility in the uplands. In other words, cultivation is becoming increasingly stabilized but with technical innovation lagging behind. It is of cardinal importance, therefore, that the increase in dry zone population be accompanied by development of improved farming systems and husbandry techniques.

A further consequence of increasing population pressure is the growing fragmentation of the land and reduction of traditional farms into various subcategories (see Table 5). The more farms become subdivided, the more constrained farmers' production options become. Access to land ownership is also becoming more difficult. As mentioned above, approximately 13 percent of small holder families in the project area are tenant cultivators (owning no land). While no precise data are available on the size of the country's landless labor population, it is estimated to be around 400,000 individuals or equal to roughly 20 percent of all persons employed in agriculture.

Although average family size has shown a modest decline over the past twenty years, rural households remain relatively large with an average of 5.5 members per household; nearly one fifth have more than seven members. Also important to note in terms of employment is that more than one-fourth of the rural population is between the ages of 19 and 35. If the 14-18 age group is added, this figure increases to nearly 40 percent. Approximately 46 percent of Sri Lanka's labor force is in agriculture* (1980 data), a decline from 50 percent in 1971. However, even with the shift of women out of agriculture, more than 50 percent of employed females continue to work in this sector, which remains an important source of livelihood for both women and men.

* Includes hunting, forestry and fishing.

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Income growth and distribution are increasingly salient topics. Prima facie evidence (Central Bank Socio-economic Survey, 1978/79) indicates that the mean income per income receiver increased at all income levels in all three sectors (urban, rural and estate) over the period 1973-79. This increase in income, however, has not been equitably distributed. In both urban and rural sectors, the only income group that increased its relative share of total income between 1973 and 1979 was the highest 20 percent of income receivers. A favorable equity shift took place in the estate sector, where relative shares increased for the bottom 80 percent of income receivers and decreased for the highest 20 percent, probably as a consequence of land reforms. This overall picture is confirmed by the Gini Index which worsened in the urban and rural sectors and improved in the estate sector over the 1973-79 period.

The nutritional situation has clearly deteriorated and is indirect evidence that purchasing power has been declining. A comparison of 1960/70 and 1980/81 socio-economic surveys (Department of Census and Statistics) yields the following observations for the rural sector: Average per capita energy intake declined from 2268 kcal in 1969/70 to 2210 kcal in 1980/81, and average per capita protein intake decreased from 51.2 gm to 49.8 gm. These findings clearly underscore the need for greater output of a greater variety of foods in rural areas and for maximum participation of the community in the production process.

4. Assessment of Socio-cultural Feasibility

a. Factors Supporting Feasibility

The extent to which the project achieves its goals depends to a high degree on the extent to which the farmer and farm household are established as the starting point in research and extension work. As data on the target group demonstrate, small farmers in Sri Lanka by no means constitute a homogeneous group. Ergo, an across-the-board, generalized approach to increasing SFC production is unlikely either to succeed or to benefit the target group. Farmers differ markedly— as do agro-climatic conditions— in Sri Lanka. Farm operations are not equally viable and hence farmers will not be equally responsive to technological solutions proposed without careful reference to their particular set of socio-cultural, economic and agronomic conditions. It may be necessary to distinguish viable commercial farmers from the more marginal farmers, and formulate different technological packages for each.

The farming systems approach proposed under the project will help ensure that the farmer and farm household are the reference point and active participants in SFC research and extension. The value of this kind of a system of cooperative experimentation between the research scientist, extension worker and farmer cannot be overstated. It is only in this way that research recommendations can be provided which are socially, culturally and economically relevant and responsive to farmers' needs.

History shows that Sri Lankan farmers are prepared to innovate, when presented with the right incentives and support services. In the rice sector, for example, the adoption and diffusion of improved technology began in the 1960s. At present, more than 85 percent of the Island's rice lands are planted with improved or high-yielding varieties, and national yields are among the highest in South and Southeast Asia.

A more recent example of the target population's propensity to innovate is the introduction of a new crop, soybean, in the early 1970s, and its emergence as an important dry zone crop within ten years. A 1982 Central Bank report states that, "a noteworthy achievement during the year was the considerable increase in soybean production. In the Maha 1981/82 alone, soybean production showed a nearly six-fold increase over the production in the previous Maha." Yet a further example of the farmer's capacity to innovate is the increased cultivation of SFC in paddy lands during the Yala season. According to the Central Bank, the Mahaweli "H" area is continuing its SFC production, particularly of chillies and pulses, in the Yala season with the result that land planted to minor field crops in the area has risen substantially. Major factors in the shift from paddy to the SFC appear to be farmer desire for higher returns and a shortage of water for paddy cultivation during Yala. The Mahaweli Authority is encouraging and supporting this trend, and beginning to design irrigation systems that will promote SFC production.

Associated with technological adaptability is a pronounced responsiveness to market conditions. Until the 1960s, the SFC were by and large grown and consumed within rural areas, with large quantities of imports being maintained to meet urban needs. Because these imports were a drain on foreign exchange resources, the GSL introduced an import-substitution program for SFC, beginning with the ban on potato imports in the late 1960s. This ban was extended in the early 1970s to cover a range of other SFC such as chillies, onions and pulses. As farmgate prices of these crops escalated sharply, producer response was immediate and dramatic. Further, at that time, the domestic retail price of wheat flour rose steeply due to a world shortage of wheat supplies. Again farmers responded, with a steep increase in domestic production of wheat flour substitutes (maize, sorghum and finger millet), proving again their awareness and sensitivity to market opportunities.

A final point is that unlike in the past, when production of SFC was dispersed on small extents in various parts of the country with small quantities being offered to cooperatives for purchase, these crops are now becoming regionally specialized. Production of chillies, onions and black gram, for instance, is concentrated in the Northern Province; sesame and cowpea in the North Central and Northwestern provinces. The trend in regional specialization is a clear signal that the foundation for commercial agriculture is being laid. Such specialization will also facilitate project implementation by enabling research, seed and extension activities to concentrate scarce resources on at least a partial geographic basis. (Main cultivation areas for the SFC are shown in the maps, Annex B.6.c.)

In many other areas, because of increasing population pressure and government regulations against misuse of the upland, chena cultivation can no longer be practiced. Farmers, therefore, are faced with the challenge of increasing output annually from the same unit of land through improved soil and water conservation practices and increasing use of modern inputs coupled, in some places, with a degree of mechanization.

The SFC sector can be said to be at a transitional stage between subsistence and commercial production. The basis for this transition was laid with the introduction of import-substitution policies beginning in the late 1960s, but with land a scarce factor of production, the need to increase per unit yields at this juncture is critical. The GSL is seeking to embark on a production strategy which maximizes returns from the scarce factors— capital, land and water— with greater inputs of the non-scarce factor, labor. It is relevant to observe that Jaffna District, where land is exceedingly scarce, is the most intensively cultivated, with yields of potatoes, chillies and onions the highest in the island.

b. Potential (Future) Constraints

Few, if any, immediate constraints to project success are foreseen. However, as more land under irrigation is planted to SFC and upland SFC production is increasingly intensified, certain features of the agricultural system will need to be monitored and appropriate action taken to remove or lessen their constraining impact on increased productivity. Among these are:

i) Land Tenure: Available data show that access to land ownership is becoming increasingly difficult. Project success will depend, in part, on GSL policies on land settlement and granting title to land, particularly in the chena areas. At the present time, it is estimated that perhaps half of all highland farmers are illegally farming state (Crown) lands. These encroachers without title may not have access, as a result, to credit facilities, nor will they necessarily be motivated to adopt proper soil and water conservation practices. However, steps are underway to regularize titles to holdings and establish more secure land tenure patterns, and land use mapping and planning are being addressed through donor assistance to the Ministry of Lands and Land Development. Land tenure, nevertheless, will require monitoring. The extent to which it (and the increasing fragmentation of land holdings) is a constraint to the development of stabilized systems will be examined during the project. Farm tenancy and leasehold arrangements will also be monitored to ensure that tenant farmers are not disadvantaged as a result of the project.

ii) Labor: Traditional SFC production can be characterized as a low-input/low-output system requiring virtually no capital and using only low-opportunity cost labor for clearing (dry season), and monitoring and crop protection (animal-scaring) during the growing season. The systems of rural labor use and demand need more study. One outcome of the project will be to contribute to this by supplementing Department of Agriculture cost of production studies with household-based, farm unit study data. Existing studies, including case studies by the DOA and by ARTI, bring out several points with respect to labor which will have to be borne in mind in the development of improved systems for SFC production.

One potential bottleneck is the availability of labor to assure fast turn around between the Maha and Yala seasons. Demands for labor for paddy harvesting and threshing may conflict with demand for Yala field preparation, if improved SFC varieties for this season are available. Another factor is the migratory nature of much agricultural labor. Also, many laborers do not remain laborers over the course of their lives. Migrants from the wet zone in particular may be young men who in a few years will settle and begin cultivation, either with or without government sanction. Projections of future labor demand and supply will have to take these patterns into account. Yet another point is that women seem to have

a relatively high degree of responsibility for SFC, particularly those grown on homegarden lands, but, to some extent, for those on other upland plots as well. Improvements in SFC cultivation, particularly those involving changes in levels of labor input and in cropping schedules, will have to take into account the effects on demand for women's labor, and the effects of this on the women themselves and on the farm household as a whole. This may vary to some degree according to ethnic community, since data show that Sinhala women play a more active role in SFC production (primarily in selection and selling) than women from other ethnic groups.

Ethnic identification also affects agricultural labor in general: the Sinhalese tend to rely on mutual aid (relatives and neighbors) for their labor needs, while Tamil and Moslem farmers normally hire outside labor.

iii) Access to Credit: While large-scale farmers generally have available capital or can easily obtain sufficient credit, small holders and tenants are less fortunate. They frequently must borrow to obtain inputs, either through the government agriculture loan programs or from private money lenders. Most farmers rely upon the latter, despite interest rates that often exceed 10% per month. The reasons are many: the government loan program is often perceived as too complicated and impersonal; tenants have no land to pledge as collateral, and more traditional peasants are reluctant to do so; defaulters are not eligible for new loans; farmers are often unwilling to forgo the special client status they enjoy with local moneylenders in return for cheaper loans; and, loans from local moneylenders are not restricted to agriculture but serve a host of social and economic needs. Access to credit is an area where significant improvements will be needed. Virtually no production credit is presently utilized by SFC producers, whose main inputs are family labor, land, and home-grown seed. The extent to which these producers are prepared to innovate may depend on how easily they can obtain access to credit. This problem is receiving critical attention under the National Agriculture, Food and Nutrition Strategy currently being developed by the GSL with USAID assistance, and new credit interventions are being proposed within the context of the Strategy.

iv) Tillage Power: Upland farmers are not mechanized to any extent at present, their principal tool for cultivation being the mamoty, a heavy, short-handled hoe. The same mamoty is used on their lowland paddy, often augmented, however, by a hired tractor or bullocks for ploughing. Use of bullock and tractor-drawn equipment is hampered on chena lands because of the presence of stumps and roots of burnt trees and shrubs. Eventually, when upland cultivation becomes continuous, the stumps and roots will rot, or be cleared, and these obstacles to animal (or tractor) drawn equipment will disappear. This is an important consideration since it is estimated that probably 3.5 acres will be the maximum that a normal family will be able to cultivate using only the mamoty. However, the limit to the cultivable area imposed by the mamoty means that the highland family without access to lowland paddy (i.e., a reasonably assured food supply) will not have enough land to live adequately. In bad years, which are not infrequent, they may be unable to feed themselves.

Upland farmers of the future, particularly those without paddy, must have the capacity to cultivate a larger area in order to support their households. This will require use of bullocks as draught animals (or a tractor) and appropriate equipment. Bullocks will require a source of fodder, so bullock owners must have a source of grass and legume forage crops for the rainy seasons, and some form of feed for the animals during the dry periods, since the animals must do the cultivation at the beginning of the rains, when fodder is not growing.*

Project managers will need to bear in mind the limited availability of tillage power. Most tillage, considering both uplands and paddy, is done by tractors (44 percent) and water buffalo (37 percent), while on very small holdings the aforementioned hand hoes (19 percent) are used. Tractors are more expensive to hire than buffalo but can complete land preparation more quickly (by a factor of 8). Although the marginal labor productivity of tractor use does not justify its high cost, farmers are often left with no alternative given the short supply of buffalo and the need to complete operations quickly.

v) Organization: In the case of irrigated production of SFC, there are particular organizational issues. A widespread desire among GSL administrators in the new settlement areas under the Mahaweli and similar canal-based systems such as the Gal Oya project, is to persuade and organize farmers to grow SFC under irrigation during the Yala season, when water is less plentiful in the reservoirs, and to be able to specify certain areas of land in canal command areas as only for irrigated SFC production, even during the Maha season. For this to be successful, a fairly sophisticated system of farmer organization is required.

In the success or failure of such plans, much will depend on the ability of the canal system itself to be operated on a schedule and at rates of flow which are suitable for the SFC. If these conditions are met, and if problems such as seepage, which make it impossible for some farmers to grow anything but paddy, are dealt with, this would assist in achieving the degree of farmer organization required.

In planning and implementing the organizational changes in the main system, and the farmer consultations and training which will be necessary, full use will be made of experience in Sri Lanka and elsewhere in irrigation system development and in the analysis of farmers' irrigation organizations. Research into optimal organizational and management systems will be undertaken, and the results monitored, during the life of the project. The project will build on USAID's experience with farmer organization in the AID-assisted Water Management and Mahaweli Projects.

* H.G.Dion and L.B.Liemens, "Review of the Sri Lanka-Canada Dryland Agricultural Project 1978-1983," September-October, 1983.

5. Participation

Beneficiary participation in the project has been a major objective from the outset. It will be accomplished primarily by making subsidiary field crop research genuinely farmer oriented through a farming systems approach and through on-farm research and demonstration work which places the farmer---or, more accurately, the farm household--- squarely at the core of all activity.

This approach is new to the Department of Agriculture which, despite such programs as the Training and Visitation System, research and extension dialogues, and RIWGS, still largely practices a top-down approach to research and technology transfer. Thus, while field trials may be conducted on farmers' fields, they are carried out with limited farmer participation and rarely in the context of the farmer's operations as a whole or the constraints affecting them.

In order for the project to be successful, a concerted effort will be required to introduce and slowly institutionalize the farming systems concept within the DOA. The project provides for this through, inter alia, (a) an early implementation workshop which will emphasize the centrality of the Farming System Research (FSR) approach to the project; (b) a minimum four-year contract Chief-of-Party with a strong farming systems background; (c) a farming systems workshop scheduled for the latter half of 1985; and, (d) the phased introduction of multi-disciplinary FSR teams at seven research stations over the life of the project. These and other measures - e.g., short-term TA in selected aspects of FSR, socioeconomic studies, and evaluations which assess adoption of the FSR as a major project objective - will help assure the application of the FSR concept in SFC research and technology transfer. This, in turn, will help guarantee effective target group participation.

6. Project Benefits

Research results take time to be produced, tested, extended, and adopted. For this reason, project benefits, while they can be identified before and during the project, may not really be measurable for 10 to 15 years thereafter. Thus, the target group is expected to benefit over time from the project as improved technologies and seed are made available to it. Anticipated direct benefits include increased farm income; expanded employment, both on-farm and in agriculture-related activities, e.g., marketing, processing; improved nutrition through increased consumption of protein-rich legumes and overall increased food availability; and increased income for private seed growers and distributors.

Principal project beneficiaries are expected to be the roughly 513,000 farm families (2.8 million people, 19 percent Sri Lanka's total population) in the dry and intermediate zones who own and farm both paddy and uplands.

Further, given that the project will seek to develop a technology for maximizing returns to the scarce factors of production— land, capital and water— with greater inputs of the non-scarce factor, labor, it should lead to increased employment of labor in agricultural production. An indirect benefit from this project, therefore, will accrue to the landless labor population numbering close to 400,000 families. It is not unreasonable to expect that at least 20 percent of this population will benefit from increased employment opportunities, for the small-holder sector is presently functioning at only one-third to one half of its capacity, and can easily absorb additional labor. This would amount to about 80,000 landless laborers and their families, or 440,000 individuals, comprising three percent of the total population.

Improved farming systems and cropping practices, coupled with widespread increases in agricultural productivity, will benefit not only the rural population in terms of income, employment and nutrition, but also the urban population in terms of lower prices and greater availability of a wider variety of cereals and pulses. The population as a whole will benefit in the long run from project impact on resource conservation resulting in increased protection of the country's limited natural resource base, and from the project's contributions to foreign exchange savings and export earnings. A consequence of a widespread increase in agricultural diversification and productivity will be improvement in both rural and urban welfare.

ADMINISTRATIVE ANALYSIS

1. Organization

The Department of Agriculture, headquartered in Peradeniya, is the main implementing arm of the Ministry of Agricultural Development and Research (MADR). It is under the Director of Agriculture (DA), and consists of eight divisions, each headed by a Deputy Director. Of the eight divisions, five will have direct operational responsibilities for the project: Research (basically production research); Seeds (improved seed); Extension, and Education and Training (technology transfer); and Agricultural Economics and Projects (social and economic studies and project impact evaluation). Organization charts for the DOA and each participating division are located at the end of this Annex, with the exception of the Seed Division which has been recently reorganized.

The basic organization of the Department is reasonable. The Director, through his Divisional Deputy Directors, will have line authority over all project activities. Coordination of activities at the Department level is facilitated by the proximity of the Director and Deputy Directors, and frequent DA/inter-divisional meetings. At lower echelons of the Department, i.e., nearer the farmers, the Regional Technical Working Groups (RTWG) and the monthly research-extension dialogues provide a relatively effective mechanism for inter-divisional communication and coordination.

2. Budget and Expenditure

Subject to certain restrictions, the DOA is fully authorized to make expenditures within its approved budget. The Chief Accountant is responsible to the DA to see that proper procedures are followed and to account for all Departmental expenditures. Each division is responsible for its own accounting, with supervision from the Chief Accountant. While delegation of authority for expenditure seems reasonable, national-level budgetary stringencies tend to slow commitments of funds, and delays are frequent. This will be closely monitored during project implementation.

Annually, in March/April each division prepares a proposed budget for the next fiscal year (the GSL fiscal year coincides with the calendar year) which is then consolidated in a DOA budget which is reviewed and modified, as necessary, by the MADR prior to submission to the Ministry of Finance and Planning. To help assure the availability of adequate GSL resources for the project, including authorization for all foreign exchange-financed line items, annual project reviews are scheduled for March/April to, among other tasks, develop detailed work plans and corresponding budget estimates for the next fiscal year.

3. Establishment of Program Priorities

In terms of broad programs, guidance is provided by the Government through the MADR. Within the Department, priorities for research, technology transfer, and seed improvement and production are established via the systematic interaction of divisional staff both at the field level (in the RTWG), and in DOA headquarters. The semi-annual RTWG meetings which address a range of subjects relating to progress and problems in research, extension, and seed production programs, serve as a means for determining regional research priorities, and provide a forum for review and

For individual crops, national crop coordinators are important in the identification of constraints to increased production of the crops for which they are responsible. They participate in RTWG meetings and have a key role in determining national priorities for research from the standpoint of individual SFC.

4. Management Capability

As noted, the basic organization of the Department is conducive to good management procedures. The Director can orchestrate a broad range of agronomic research, technology transfer, seed production, and socio-economic research activities through his Deputy Directors. He has the authority to approve program priorities and make resource allocations based on inputs from the Regional and District levels. The DA and the Deputy Directors are senior scientists/administrators, with both technical and management backgrounds. Management capability, however, needs support and improvement at all levels. This will be addressed under the project through short-term and in-service training (making use, where possible, of in-country and regional management institutions); observational trips to Asian agricultural research institutions; and, technical assistance, as outlined in the Project Description.

The DOA's overall program in the SFC, and the success of this project will require close cooperation and mutual support among the divisions of the Department. Without strong and effective management, efforts could devolve into relatively uncoordinated activities, to the detriment of overall project objectives. Accordingly, a Project Management Unit (PMU) with both administrative and technical responsibilities and headed by a GSL Project Manager, appointed by the DA, will be established. The PMU will be expected to deal professionally with scientists and administrators in the different divisions, and will be adequately staffed and supported by the DOA. The contractor Chief-of-Party will work closely with the PMU.

Above the PMU will be a Project Coordinating Committee (PCC) chaired by the Secretary, MADR. This committee will meet quarterly (at a minimum), to deal with a broad range of issues including overall objectives, strategies, and priorities, review of work plans, procurement, technical assistance and training schedules, and timing and substance of periodic reviews and evaluations. Day-to-day operations, coordination and communication, and the programming and general support of the long and short-term consultants, will be handled by the Project Management Unit. However, consultants' day-to-day work will be with designated counterparts within the divisions, which will bear responsibility for their operational support (e.g., facilities, transportation and secretarial and administrative support) with the exception of fuel for vehicles assigned to long-term advisors which will be included in the technical assistance contract.

The Project Coordinating Committee, or appropriate elements of it, will meet with the Minister at least once a year to brief him on project progress and raise matters requiring solution at that level. At the PCC level, it is anticipated that participation from other ministries may be appropriate, e.g., the Mahaweli (SFC under irrigation), Rural Industrial Development (livestock in farming systems), and Finance and Planning (National Planning Division as well as External Resources).

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5. Staffing and Staff Support

The Department comprises some 18,000 employees, from the Director down to office, field, and laboratory assistants. Within this total, there are 195 different grades. There are 76 trade unions which involve one or more grades of the staff and can complicate administration at all levels. For purposes of this project, staff are neither adequate in numbers nor adequately trained. There are numerous vacancies in the RRC and ISTI, caused in large measure by lack of professional support/development, and such basic needs as schooling, medical facilities, housing, water, and electricity. As outlined in the Technical Analysis, work on the SFC is severely constrained by inadequate research and seed production/processing facilities and equipment, and all five divisions are hampered by insufficient transportation. The GSL is aware of the importance of these issues, and many will be addressed by the project. However, until working and living conditions are improved, staff turnover will likely continue, with possible adverse impacts on project implementation. Support to DOA field staff will be encouraged by USAID throughout the project, and will be carefully monitored.

This project will constitute the core of the Department's overall SFC program. All related work will be undertaken through or in cooperation with the project, thus minimizing the problem of divided loyalties, and overlapping work programs and responsibilities of DOA staff. However, there are and will be other projects underway in the SFC during the life of this project requiring specific staff commitments on the part of the DOA. These projects, for the most part, however, will be smaller, and are generally expected to complement the work of this project.

The other major project in the Research Division, for example, will be the proposed Phase II of the CIDA-supported Dryland Agricultural Research Project, based at the Maha Illupalama RRC. This project, scheduled to start in 1985, will require a GSL staff commitment of approximately seven, more or less full-time, research officers, plus the national cropping systems coordinator on a part-time basis, and will fund twelve advanced degrees for research personnel.

In the Extension, Education and Training, and Economics and Projects Divisions, there will be virtually no other donor project activity for the foreseeable future once the World Bank-Supported AEARP terminates at the end of 1985. In Seeds, with the phase-out of West German assistance, there is now no other major donor involvement. The Netherlands Government will continue to provide commodity support to the rice seed program, which is complementary to the efforts of the AID project.

The Department is planning to add technical and support staff during the next few years expressly to strengthen the SFC program. As an initial step, the Division of Research will add at least 17 scientists to strengthen research on the SFC, including plant breeders, agronomists, and microbiologists, and eight Research Assistants; the Education and Training Division plans to add five Subject Matter Specialists to be stationed at In-Service Training Institutes where the SFC are important; the Extension Division will add three editors to its publications staff; and the Seeds Division will add 11 field level staff (AI's and KVS') to support the private certified seed grower program.

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With some exceptions, however, the basic problem is staff quality rather than numbers. Training is an overriding need in all divisions, and will be a major project input. While training will be primarily discipline or commodity-oriented, project assistance, as noted above, will also be provided to improve management and administrative capability. The availability of qualified staff in the early phases of implementation may be problematic in at least some RRC with active other-donor projects (e.g., Maha Illupalama, where the CIDA and ADB Projects are based), and where each donor is giving high priority to training of existing staff. At these locations, both the research and training elements of this project will need to be closely coordinated with those of the other donors, and project implementation will be phased accordingly.

6. Commodity Procurement and Management

The DOA has considerable experience in commodity procurement, utilizing standard international procedures. Most procurement is subject to tendering, with varying approval authority at different levels of the organization. Procurement up to Rs.2 million (\$80,000) can be approved within the Department. The MADR can approve procurement between Rs.2 and 5 million (\$200,000); all procurement over that amount must go to a cabinet-level tender board. Apart from issuance and approval of procurement tenders in excess of Rs. 2 million, all commodity procurement and all commodity management is internal to the DOA. Technical specifications for all equipment are prepared by the Agricultural Engineering Division in conjunction with personnel from other involved divisions.

Commodities are cleared and received at DOA stores in Colombo. Equipment is transferred to Engineering Division stores for bulk breaking (where necessary), inspection and distribution. Items are received and entered into inventory at each management unit; survey boards regularly review and audit commodity records and use. Overall GSL procurement procedures and controls are cumbersome and time consuming, but workable. However, management of major international procurement actions from DOA headquarters in Peradeniya (approximately 70 miles from Colombo) is problematic, due in large part to unreliable communications links. Therefore, the DOA will utilize a U.S. procurement services agent to handle the majority of off-shore procurement (see Commodity Procurement Plan, Annex B.9).

7. Engineering, Design and Construction Capability

The Civil Engineering Section (CES) of the DOA is responsible for design and construction of all DOA facilities. This Section has many years of experience in designing and constructing all types of buildings and facilities used by the DOA. It is headed by a Superintending Engineer assisted by six civil engineers, site inspectors and drafting personnel. Standard construction tender procedures are followed. The Engineering Division, on behalf of the other divisions, prepares plans and tender documents, and supervises all construction. (The only exception is in the case of the Seeds Division, where Farm Managers have limited authority to undertake construction using local labor.) Delegation of construction tendering and approval authority is comparable to that for commodity procurement.

The CES' normal work load fully utilizes its present staff, and it would have extreme difficulty in hiring extra staff to perform any additional work because of staffing and salary restrictions. Therefore, the design and supervision of construction services under the project will be contracted out to a private A&E firm. The CES has the capability to supervise the A&E and construction firms. There are many small- to medium-size A&E firms in the country in need of new work as engineering design activities under the Mahaweli Program begins to slow down.

The private construction industry was completely taken over by public companies during the previous government. The present government is directing its efforts toward rebuilding the private construction industry.

During the past five years, many small contractors engaged in work similar to that proposed under the project have been established mainly at the behest of the Mahaweli Authority under the Accelerated Mahaweli Program. These contractors are capable and have experienced staff who can perform construction work under this project. The project is ideally suited to dividing the construction work into small contracts, each covering all work at each of the twelve project sites. Thus, the project will assist in further developing the small but growing private construction industry in the country.

MINISTRY
OF
AGRICULTURAL DEVELOPMENT & RESEARCH

DEPARTMENT OF AGRICULTURE

DIRECTOR OF AGRICULTURE

ADMINISTRATION
DIVISION

FINANCE
DIVISION

EXTENSION
DIVISION

RESEARCH
DIVISION

EDUCATION
& TRAINING

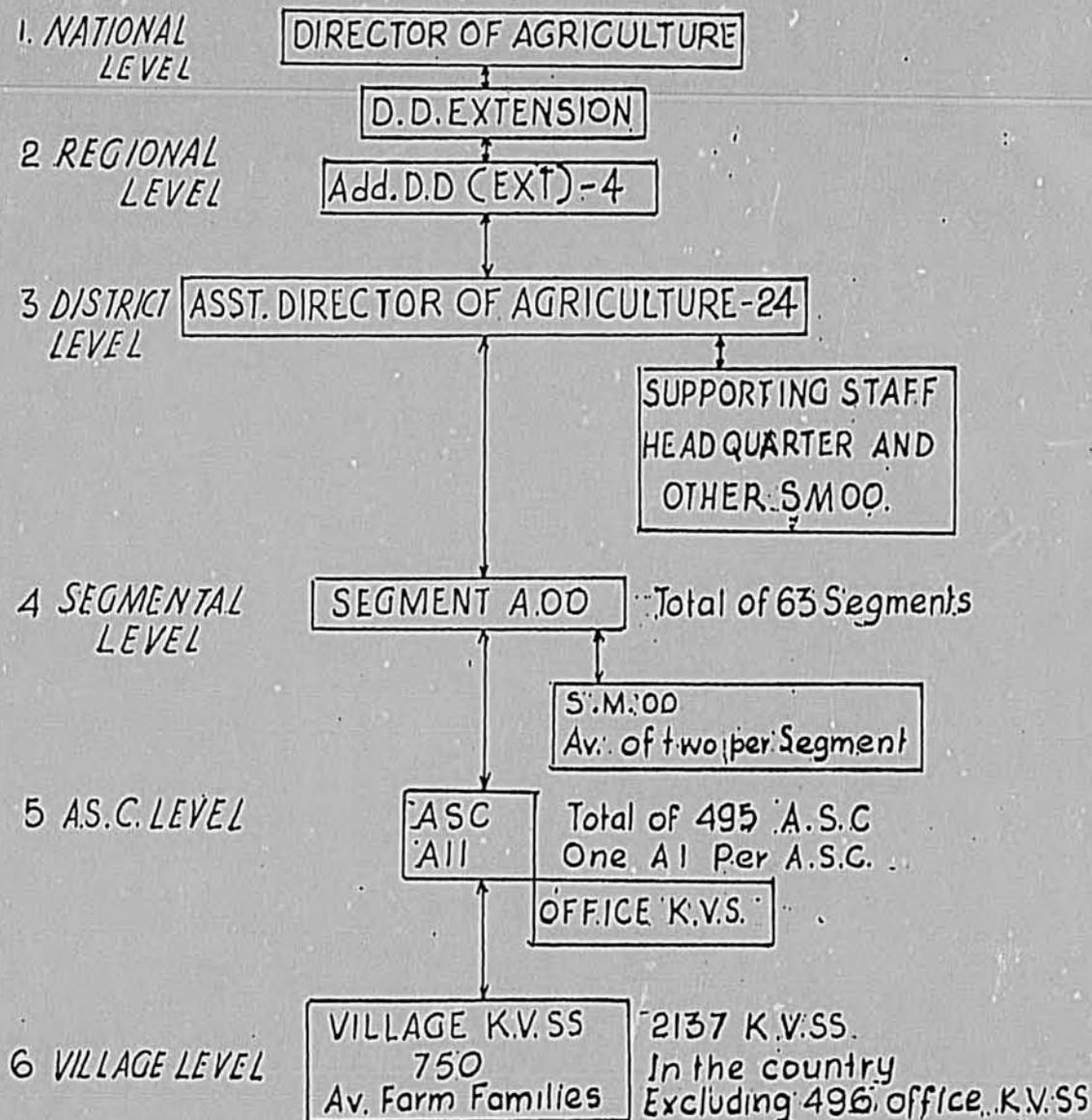
FARMS AND
HORTICULTURE

AGRICULTURAL
ECONOMICS

AGRICULTURAL
ENGINEERING

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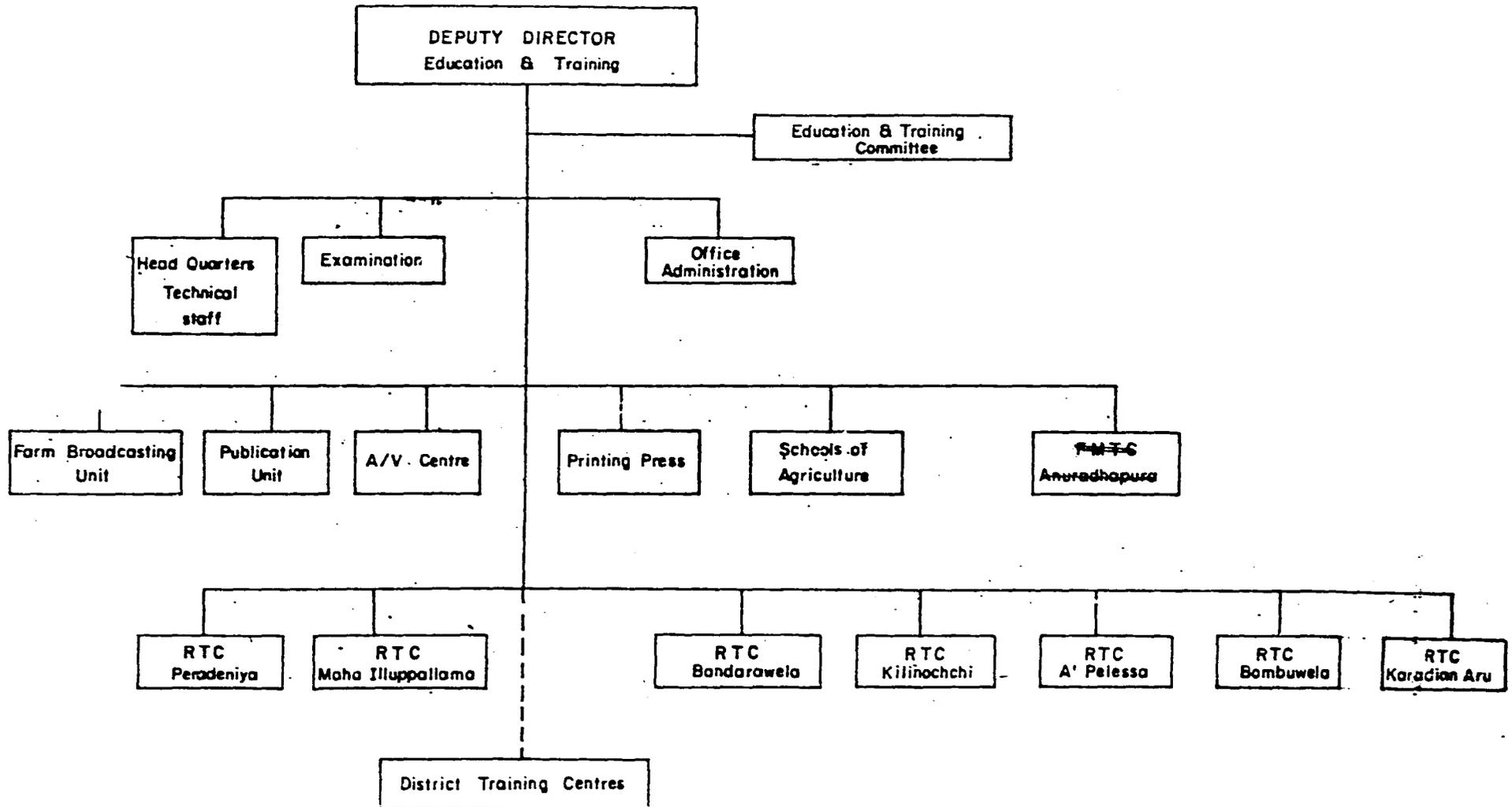
STRUCTURE OF EXTENSION ORGANIZATION



NOTE

- D.D. - Deputy Director.
- Add. DD - Additional Deputy Director.
- A.I.I. - Agricultural Instructors.
- A.O.O - Agricultural Officers.
- S.M.OO. - Subject Matter Officers
- A.S.C. - Agrarian Service Centre
- K.V.S. - Village Level Extension Worker.

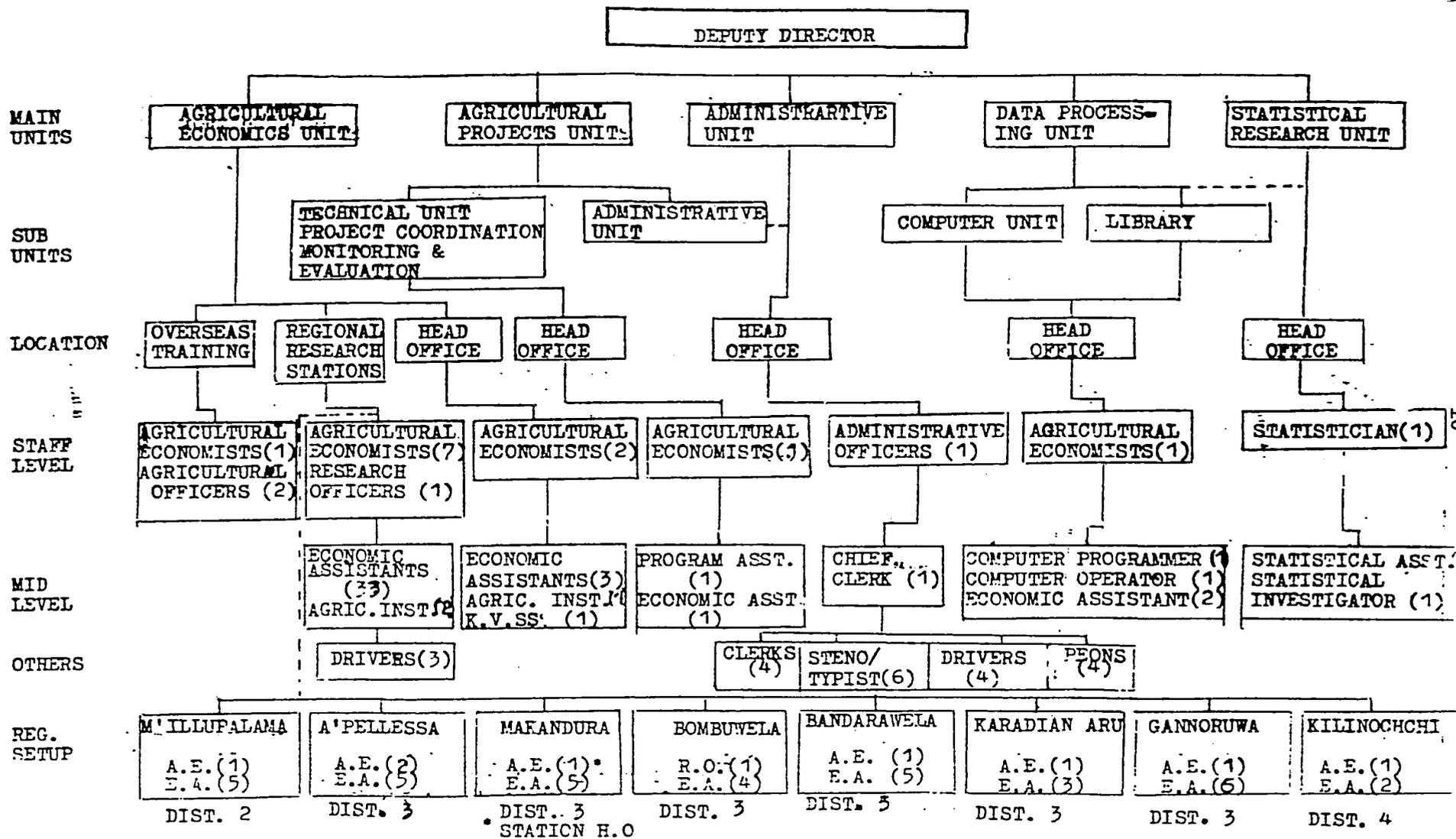
ORGANIZATION CHART OF EDUCATION & TRAINING DIVISION



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ORGANIZATIONAL CHART
DIVISION OF AGRICULTURAL ECONOMICS AND PROJECTS (On 15.12.1983)

AV7



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ENGINEERING AND CONSTRUCTION ANALYSIS

A. GENERAL

There are 84 buildings and structures to be constructed or remodelled under the project. The facilities are located at seven regional research centers, four seed farms and five seed processing centers. The buildings and structures consist of research laboratories, equipment workshops, stores, screenhouses, refrigerated storage buildings, seed processing and storage buildings, airconditioned storage buildings, staff quarters and remodelling of an underground rain water storage system, research laboratories, screenhouses and storage buildings. See Appendix 1 for location and number of buildings and structures at each site.

B. DESCRIPTION AND LOCATION OF FACILITIES

1. Regional Research Centers: The seven regional research centers are:

a. Makandura Research Center located in Kurunegala District off highway number A3, approximately 20 kilometers northeast of the town of Negombo;

b. Karadiyan Aru Research Center located in Batticaloa District off highway number A5, approximately 20 kilometers east of the city of Batticaloa;

c. Angunakolapelessa Research Center located in Hambantota District off highway number A2, approximately 30 kilometers northwest of the city of Hambantota;

d. Girandukotte Research Center located in Badulla District off highway number A5, approximately 30 kilometers north of the city of Mahiyangana;

e. Killinochchi Research Center located in Killinochchi District on highway number A9, near the city of Killinochchi;

f. Maha Illuppallama Research Center located in Anuradhapura District off highway number A12, approximately 30 kilometers south of the city of Anuradhapura;

g. Bandarawela Research Center located in Badulla District off highway number A16, approximately 30 kilometers southwest of the city of Badulla.

2. Seed Farms and Processing Centers: The four seed farms and five seed processing centers are:

a. Pelwehera farm and Processing Center located in Matale District off highway number A6, approximately 10 kilometers southwest of the city of Dambulla;

b. Aluththarama Farm and Processing Center located in Badulla District off highway number A5, approximately 35 kilometers northwest of the city of Badulla;

c. Bata Ata Farm and Processing Center located in Matara District off highway number A2, approximately 10 kilometers northeast of the city of Matara;

d. Paranthan Processing Center and Killinochchi farm, located in Killinochchi District highway number A9, approximately 10 kilometers north of the city of Killinochchi;

e. Nikaweratiya Processing Center located in Kurunegala District off highway number A10, approximately 40 kilometers southeast of Puttalam.

C. DESCRIPTION OF BUILDINGS AND STRUCTURES

1. Research Laboratory: The DOA proposes to build its standard regional research laboratory, plan No. 4480, which has a floor area of approximately 3,680 square feet. It provides for three laboratory rooms (20' x 30'), three offices (10' x 10') for researchers, an office (30' x 30') for the Chief of SFC Research Officer, a Station stores, and toilet facilities. The laboratory rooms are provided with work benches and two sinks. The building will have concrete foundations, brick floors and wall plastered with cement mortar, concrete columns and steel roof trusses with asbestos roofing.

2. Equipment Workshop: The DOA proposes to build its standard equipment and machinery workshop, plan No. 4525, which has a floor area of approximately 1,200 square feet. It provides for two equipment repair work bays (10' x 30'), one bay closed in by a half wall and the other bay open; a storeroom (10' x 15') and an office (10' x 15'). A ramp for servicing vehicles is provided adjacent to the building. The building will have concrete foundations, brick floors and walls plastered with cement mortar, concrete columns and steel roof trusses with asbestos roofing.

3. Stores Building: The DOA proposes to design and construct a stores building which has a floor area of approximately 1,200 square feet. The building will have separate rooms for strong agrochemicals, seed, laboratory equipment, general utility equipment, fuel, and fertilizer. A small office will be provided for the storekeeper. All rooms will be provided with wood racks and shelves. The building will have a loading ramp adjacent to the building. The stores building will have concrete foundations, brick floors and walls plastered with cement mortar, concrete columns and steel roof trusses with asbestos roofing.

4. Screenhouse: The DOA proposes to build its standard screenhouse, plan No. 4354, which has a floor area of approximately 2,250 square feet. It is a 30' x 75' building with a central portion dividing them into two equal sections. The walls are made of brick up to a height of 3 feet and thereafter wire screening is provided to completely enclose the building and make it insect proof. The building will have concrete foundations, brick floors and walls (3' high) plastered with cement mortar and steel roof trusses with plain glass roofing fitted to wood panels.

5. Refrigerated Storage Building: The DOA proposes to design and construct a refrigerated storage building which has a floor area of approximately 300 square feet. The inside temperature of the building must be maintained between 10-15 C. The building will have concrete foundations, brick floors and walls plastered with cement mortar, concrete columns and a reinforced concrete roof. The walls and roof will have polystyrene insulation, and a special insulated double door will be provided with an automatic door closer. The building provides for

a refrigeration unit financed by the project (see Commodity/Equipment List, Annex B.9) large enough to maintain the required temperature.

6. Processing and Storage Building: The DOA proposes to build its standard processing and storage building plan No. 4579, which has a floor area of approximately 4,000 square feet. The building is 40' x 100' with provision for three seed processing machines. The building will have concrete foundations, brick floors and walls plastered with cement mortar, concrete columns and steel roof trusses with asbestos roofing. The floor is about 3 feet above ground level. The roof is about 15 feet high with concrete louvers provided around the building to provide proper ventilation.

7. Airconditioned Storage Building: The work involved is converting a part of a 50' x 40' existing stores building to an airconditioned stores unit (20' x 15' x 10') to maintain an inside temperature of 65 F. This will require the construction of a reinforced concrete ceiling, polystyrene insulation of walls and ceiling and installation of double insulated door with an automatic door closer. It includes provision of installing air conditioners which will be financed by the project (see Annex B.9).

8. Drying Floor: This is a 100' x 100' floor slab, 9 inches thick, consisting of brick covered with cement mortar that will be used for drying seeds.

9. Staff Quarters:

a. Class II Quarters: The DOA proposes to build its standard Class II quarters, plan No. 4403, which has a floor area of 525 square ft. It has one large and two small bedrooms, dining and living rooms, kitchen and toilet.

b. Class III Quarters: The DOA proposes to build its standard Class III quarters, plan No. 4515, which has a floor area of 732 square feet. It has two bedrooms, living and dining rooms, kitchen, toilet and storeroom.

c. Class IV Quarters: The DOA proposes to build its standard Class IV quarters, plan No. 4444, which has a floor area of 1,326 square feet. It has three bedrooms, living and dining rooms, visitors room, kitchen, toilet, utility room and servants room with attached toilet. The normal garage has been converted into the visitors' room. In some cases, the garage will be built instead of the visitors' room.

10. Repairs to Laboratory: This work consists of major repairs to existing laboratories to bring them up to present Department design standards.

11. Repairs to Screenhouse: This work consists of major repairs to existing screenhouses to bring them up to present Department design standards.

12. Repair of Storage Building: This work consists of improving the ventilation of existing 50' x 40' storage buildings to bring them up to present Department design standards. This requires raising the roofs and providing concrete louvers around the exterior of the building.

13. Repair of Underground Rainwater Storage System: This work consists of major repairs to an underground rainwater storage system, including overhead reservoir and collection system.

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D. DESIGN CRITERIA, ENGINEERING SURVEYS AND DATA

The Engineering Section of the DOA has developed and presently utilizes standard design criteria for all types of building construction and agricultural support facilities. These design standards and drawings will be used in final designs for the project. It will be necessary to modify their criteria somewhat to meet AID and project requirements. Preliminary studies have been made in sufficient detail to permit calculation of work quantities for all major elements of construction. Sufficient survey and other data are available in the DOA to determine that sites are suitable for expansion of facilities and there will be no major foundation problems. All sites have reliable water and power supplies which will be expanded under the project.

E. PLANS, SPECIFICATIONS AND CONSTRUCTION SCHEDULES

The DOA's standard plans, technical specifications and contract documents have been reviewed and found suitable for use with modifications to meet AID requirements and site conditions. Preliminary plans and drawings for the main elements of the project are sufficient to permit a reasonably firm cost estimate to be made. All auxiliary features such as site preparation, landscaping, water supply, sewerage, power supply, etc., were considered in the review. Standard plans, specifications and contract documents are available in USAID, Sri Lanka.

F. LABOR, MATERIALS AND EQUIPMENT

1. Labor: Construction will be labor intensive, and all construction work is expected to be performed by private Sri Lankan firms. The preliminary engineering and design work will require approximately one year. The physical construction work will require approximately two years. However, due to budgetary constraints, the construction work may be spread over three or more years. Adequate skilled and unskilled labor are available for the project.

a. Engineering and Design Capability: The Civil Engineering Section (CES) of the DOA is responsible for design and construction of all DOA facilities. This section has many years of experience in designing and constructing all types of buildings and facilities used by the DOA. It is headed by a Superintending Engineer assisted by six civil engineers, site inspectors and drafting personnel. Because its normal workload fully utilizes its present staff, the design and supervision of construction services will need to be contracted out to a private A&E firm. The CES has the capability to supervise the A&E and construction firms. The CES would have extreme difficulty in hiring additional staff to perform this work because of staffing and salary restrictions. There are many small- to medium-size A&E firms in Sri Lanka in need of new work as the engineering design work in the Mahaweli Program begins to slow down.

b. Construction Capability: The private construction industry was completely taken over by public companies during the previous government. The present government is directing its efforts toward rebuilding the private construction industry. During the past five years, many small contractors doing similar work have been established, largely in response to the Accelerated Mahaweli Program. These contractors are capable and have experienced staff who can perform construction work of the type

proposed. The project is ideally suited to dividing the construction work into small contracts with each contract covering all work at each of the twelve sites. This project will assist in further developing the small but growing private construction industry in the country.

2. Materials: Virtually all of the materials required for the construction work are available in Sri Lanka. All items not available either in the required quantity and quality in Sri Lanka will be purchased from the U.S. or Code 941 countries. Generally, most items not manufactured in Sri Lanka can be bought off-shelf under AID's off-shelf procurement procedures.

3. Equipment: Construction equipment needs are minimal since most work will be undertaken using labor intensive methods rather than equipment. The local Sri Lankan contractors will be responsible for providing all construction plant and equipment. These contractors either have the required equipment already or will be able to buy it easily from local dealers in the country under off-shelf procurement procedures.

G. SPECIAL CONSTRUCTION PROBLEMS

There are no special climatic conditions such as time and length of wet and dry seasons that will seriously constrain construction work. There will be no special import problems for materials or equipment. There are no special technical problems.

H. CONSTRUCTION MANAGEMENT AND SUPERVISION

The Civil Engineering Section of the Department of Agriculture will be the responsible agency for the design and construction of facilities. Design and construction supervision services will be contracted out to a private Sri Lankan A&E firm. The construction services will be contracted out to one or more private Sri Lankan contractors. The work is scattered among 12 sites throughout the country and is not of a magnitude that a U.S. contractor would be competitive. The CES is adequately staffed to monitor and manage the engineering and construction services, but is not adequately staffed to perform the work in-house.

I. OPERATION AND MAINTENANCE

All facilities have maintenance units, and the present status of maintenance is considered reasonably satisfactory. However, maintenance funds are limited, and the project will encourage better maintenance practices and use of limited resources.

J. FINANCIAL ASPECTS

1. Estimated Capital Cost: Sufficient land is available for the new buildings and structures at the proposed locations. Thus, no investment in land or land-related problems are anticipated. Bills of quantities prepared for the buildings provide for internal water supply, drainage and electrical installation. Landscaping, fencing, construction of approach roads and connection of buildings to water mains and electric power lines will be designed and undertaken for each site. Cost estimates given below are based on Department work rates for 1984. Past experience of the Department indicates that work carried out by private contractors fall within a reasonable range of Department cost estimates. Since AID-funded construction requires better design and supervision of construction than

is normally provided by the GSL, an additional ten percent has been added to the construction cost for this purpose. Detailed cost estimates for construction services are provided in Appendix 2. The construction work will be financed by the Fixed Amount Reimbursement method (see Section IV, Cost Estimate and Financial Plan for details.)

2. Engineering and Construction Cost:

	SL Rupees	Equivalent US\$
a. Design Services	858,000	34,320
b. Supervision of Construction Services	1,284,000	51,360
c. Construction	(22,248,000)	(889,920)
1) Makandura RC	2,832,000	113,280
2) Karadiyan Aru RC	3,332,000	133,280
3) Angunakolapelessa RC	2,559,000	102,360
4) Girandurakotte RC	674,000	26,960
5) Killinochchi RC	1,617,000	64,680
6) Maha Illupallama RC	4,270,000	170,800
7) Bandarawela RC	484,000	19,360
8) Pelwehera F & PC	2,339,000	93,560
9) Aluththarama F & PC	1,684,000	67,360
10) Bata Ata F & PC	1,294,000	51,760
11) Paranthan F & PC	409,000	16,360
12) Nikaweratiya PC	846,000	33,840
Sub-Total	24,390,000	975,600
d. Contingency @ 10%	2,439,000	97,560
	26,829,000	1,073,160
e. Inflation @ 10%, com- pounded (32%)	7,676,000	312,190
f. Total Engineering & Construction Cost	34,505,000	1,385,350

3. Basis for Construction Cost: Item numbers conform with those in Appendix 2, Estimated Cost of Facilities.

1. Land - Crown land is available at no extra cost.
- 2a. Design Cost - 4% of estimated building construction cost.
- 2b. Constr. Supervision Cost - 6% of estimated building construction cost.
- 3a. Site preparation - 2% of estimated building construction cost.
- 3b. Access roads - Allows 200ft. of bitumen road 12' wide without rubble base at the rates of Rs.50/- per foot. Cost for one building is Rs.10,000/-.

- 3c. Building & Structures - 1984 DOA work rates for standard designs are used.
- 3d. Water Supply - Cost includes connecting main supply line to the house lines. A sum of Rs. 3,000/- is assumed per building.
- 3e. Sewerage - This is included in the building estimates.
- 3f. Electricity Supply - Assumed cost is Rs.8,000, allowing for two concrete posts for one building.
- 3g. Fencing - Allows 300 feet average fencing at the rate of Rs.25 per ft. and includes Rs.2,500/- for gates and gate posts for each building. Total=Rs.10,000 per building.

K. APPENDICES

1. Appendix 1 - List of Facilities and Location
2. Appendix 2 - Estimated Cost of Facilities
3. Appendix 3 - Illustrative Contract Schedule for Engineering and Construction
4. Appendix 4 - Contract Sites (Map)

APPENDIX 1

LIST OF FACILITIES AND LOCATION

A. REGIONAL RESEARCH CENTERS

1. Makandura Research Center
 - a. Research Laboratory 1 Each
 - b. Equipment Workshop 1 Each
 - c. Storeroom 1 Each
 - d. Class III Staff Quarters 3 Each
 - e. Class IV Staff Quarters 3 Each
2. Karadiyan Aru Research Center
 - a. Research Laboratory 1 Each
 - b. Equipment Workshop 1 Each
 - c. Storeroom 1 Each
 - d. Screenhouse 2 Each
 - e. Class III Staff Quarters 1 Each
 - f. Class IV Staff Quarters 4 Each
3. Angunakolapelessa Research Center
 - a. Equipment Workshop 1 Each
 - b. Refrigerated Storage Facility 1 Each
 - c. Class III Staff Quarters 3 Each
 - d. Class IV Staff Quarters 4 Each
 - e. Screenhouse 1 Each
4. Girandurakotte Research Center
 - a. Equipment Workshop 1 Each
 - b. Class III Staff Quarters 1 Each
 - c. Class IV Staff Quarters 1 Each
5. Kilinochchi Research Center
 - a. Research Laboratory 1 Each
 - b. Class III Staff Quarters 1 Each
 - c. Class IV Staff Quarters 2 Each
6. Maha Illuppallama Research Center
 - a. Research Laboratory 1 Each
 - b. Screenhouse 1 Each
 - c. Refrigerated Storage Facility 1 Each
 - d. Class III Staff Quarters 6 Each
 - e. Class IV Staff Quarters 4 Each
7. Bandarawela Research Center
 - a. Class III Staff Quarters 1 Each
 - b. Class IV Staff Quarters 1 Each

B. SEED FARMS AND PROCESSING CENTERS

1. Pelwehera Farm and Processing Center
 - a. Processing and Storage Building 2 Each
 - b. Drying Floor 1 Each
 - c. Refrigerated Storage Facility 1 Each

- | | |
|---------------------------------------------------------------------|--------|
| d. Remodelling Storage Building | 1 Each |
| e. Class II Staff Quarters | 2 Each |
| f. Class III Staff Quarters | 2 Each |
| g. Class IV Staff Quarters | 1 Each |
| 2. Aluththarama Farm and Processing Center | |
| a. Processing and Storage Building | 1 Each |
| b. Drying Floor | 1 Each |
| c. Refrigerated Storage Facility | 1 Each |
| d. Remodelling Storage Building | 1 Each |
| e. Class II Staff Quarters | 1 Each |
| f. Class III Staff Quarters | 2 Each |
| g. Class IV Staff Quarters | 1 Each |
| 3. Bata Ata Farm and Processing Center | |
| a. Processing and Storage Building | 1 Each |
| b. Drying Floor | 1 Each |
| c. Refrigerated Storage Facility | 1 Each |
| d. Remodelling Storage Building | 1 Each |
| e. Class II Staff Quarters | 1 Each |
| f. Class III Staff Quarters | 2 Each |
| 4. Paranthan Processing Center and Killinochchi Farm
(two sites) | |
| a. Refrigerated Storage Facility | 1 Each |
| b. Remodelling Storage Building | 1 Each |
| c. Class II Staff Quarters | 1 Each |
| d. Class III Staff Quarters | 1 Each |
| 5. Nikaweratiya Processing Center | |
| a. Processing and Storage Building | 1 Each |
| b. Remodelling Storage Building | 1 Each |
| c. Drying Floor | 1 Each |
| d. Refrigerated Storage Facility | 1 Each |

APPENDIX 2

ESTIMATED COST OF FACILITIES

<u>LOCATION & TYPE</u>	<u>UNIT</u>	<u>QUANTITY</u>	<u>UNIT PRICE</u> (Rupees)	<u>AMOUNT</u> (Rupees)
A. Makandura Research Center (9 buildings)				
1. Land	-	-	-	-
2. Engineering Services				
a. Design	-	-	-	123,000
b. Supervision of Constr.				184,000
3. Construction				-
a. Site Preparation				52,000
b. Access Roads				100,000
c. Buildings & Structures				
(1) Research Laboratory				
Each	1		750,000	750,000
(2) Equipment Workshop				
Each	1		160,000	160,000
(3) Storeroom				
Each	1		160,000	160,000
(4) Class III Quarters				
Each	3		140,000	420,000
(5) Class IV Quarters				
Each	3		270,000	810,000
d. Water Supply				30,000
e. Sewerage				-
f. Electricity Supply				80,000
g. Fencing				120,000
h. Construction of overhead tank				150,000
4. Total cost				<u>3,139,000</u>
B. Karadiyan Aru Research Center (10 buildings)				
1. Land				-
2. Engineering Services				
a. Design				150,000
b. Supervision of Constr.				224,000
3. Construction				
a. Site Preparation				70,000
b. Access Roads				120,000
c. Buildings & Structures				
(1) Research Laboratory				
Each	1		750,000	750,000
(2) Equipment Workshop				
Each	1		160,000	160,000
(3) Storeroom				
Each	1		160,000	160,000

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(4) Screenhouse	Each	2	300,000	600,000
(5) Class III Quarters	Each	1	140,000	140,000
(6) Class IV Quarters	Each	4	270,000	1,080,000
d. Water Supply				36,000
e. Sewerage				-
f. Electricity Supply				96,000
g. Fencing				120,000
Total Cost				<u>3,706,000</u>
C. Angunakolapelessa Research Center (10 buildings)				
1. Land				-
2. Engineering Services				
(1) Design				78,000
(2) Supervision of Constr.				117,000
3. Construction Services				
a. Site Preparation				20,000
b. Access Road				90,000
c. Building & Structures				
(1) Equipment Workshop	Each	1	160,000	160,000
(2) Refrigerated Storage	Each	1	300,000	300,000
(3) Class III Quarters	Each	3	140,000	420,000
(4) Class IV Quarters	Each	4	270,000	1,080,000
(5) Screenhouse	Each	1	300,000	300,000
d. Water Supply				27,000
e. Sewerage				-
f. Electricity Supply				72,000
g. Fencing				90,000
4. Total Cost				<u>2,754,000</u>
D. Girandurakotta Research Center (3 buildings)				
1. Land				-
2. Engineering Services				
a. Design				23,000
b. Supervision of Constr.				34,000
3. Construction Services				
a. Site Preparation				11,000
b. Access Roads				30,000
c. Building & Structures				
(1) Equipment Workshop	Each	1	160,000	160,000
(2) Class III Quarters	Each	1	140,000	140,000
(3) Class IV Quarters	Each	1	270,000	270,000

d. Water Supply			9,000
e. Sewerage			-
f. Electricity Supply			24,000
g. Fencing			30,000

4. Total Cost			731,000
E. Killinochchi Research Center (4 buildings)			
1. Land			-
2. Engineering Services			
a. Design			64,000
b. Supervision of Constr.			95,000
3. Construction Services			
a. Site Preparation			32,000
b. Access Roads			50,000
c. Buildings & Structures			
(1) Research Laboratory			
	Each	1	750,000
			750,000
(2) Class III Quarters			
	Each	1	140,000
			140,000
(3) Class IV Quarters			
	Each	2	270,000
			540,000
d. Water Supply			15,000
e. Sewerage			-
f. Electricity Supply			40,000
g. Fencing			50,000

4. Total Cost			1,776,000
F. Maha Illuppallama Research Center (13 new buildings)			
1. Land			-
2. Engineering Services			
a. Design			143,000
b. Supervision of Constr.			215,000
3. Construction Services			
a. Site Preparation			66,000
b. Access Roads			140,000
c. Building & Structures			
(1) Research Laboratory			
	Each	1	750,000
			750,000
(2) Screenhouse			
	Each	1	300,000
			300,000
(3) Refrigerated Storage			
	Each	1	300,000
			300,000
(4) Class III Quarters			
	Each	6	140,000
			840,000
(5) Class IV Quarters			
	Each	4	270,000
			1,080,000
(6) Repair Screenhouses			
	Each	2	100,000
			200,000
(7) Repair Laboratories			
	Each	2	100,000
			200,000
(8) Repair Underground rain water storage			
	Each	1	100,000
			100,000

d. Water Supply				42,000
e. Sewerage				-
f. Electricity Supply				112,000
g. Fencing				140,000

4. Total Cost				4,628,000
G. Bandarawela Research Center (2 buildings)				
1. Land				
2. Engineering Services				
a. Design				16,000
b. Supervision of Constr.				25,000
3. Construction Services				
a. Site Preparation				-
b. Access Road				8,000
c. Buildings & Structures				20,000
(1) Class III Quarters				
	Each	1	140,000	140,000
(2) Class IV Quarters				
	Each	1	270,000	270,000
d. Water Supply				6,000
e. Sewerage				-
f. Electricity Supply				16,000
g. Fencing				20,000

4. Total Cost				521,000
H. Pelwehera Farm and Processing Center (8 new buildings)				
1. Land				-
2. Engineering Services				
a. Design				82,000
b. Supervision of Constr.				123,000
3. Construction Services				
a. Site Preparation				41,000
b. Access Roads				80,000
c. Buildings & Structures				
(1) Processing and				
Storage Bldg.	Each	2	500,000	1,000,000
(2) Drying Floor	Each	1	200,000	200,000
(3) Refrigerated				
Storage	Each	1	50,000	50,000
(4) Remodelled				
Storage	Each	1	50,000	50,000
(5) Class II				
Quarters	Each	2	100,000	200,000
(6) Class III				
Quarters	Each	2	140,000	280,000
(7) Class IV				
Quarters	Each	1	270,000	270,000

d. Water Supply				24,000
e. Sewerage				-
f. Electricity Supply				64,000
g. Fencing				80,000
				<hr/>
4. Total Cost				2,544,000
I. Aluththarama Farm and Processing Center (5 new buildings)				
1. Land				-
2. Engineering Services				
a. Design				58,000
b. Supervision of Constr.				87,000
3. Construction Services				
a. Site Preparation				29,000
b. Access Roads				50,000
c. Buildings & Structures				
(1) Processing and Storage Bldg.	Each	1	500,000	500,000
(2) Drying Floor	Each	1	200,000	200,000
(3) Refrigerated Storage	Each	1	50,000	50,000
(4) Remodelled Storage	Each	1	50,000	50,000
(5) Class II Quarters	Each	1	100,000	100,000
(6) Class III Quarters	Each	2	140,000	280,000
(7) Class IV Quarters	Each	1	270,000	270,000
d. Water Supply				15,000
e. Sewerage				-
f. Electricity Supply				40,000
g. Fencing				50,000
h. Improving present water system				50,000
				<hr/>
4. Total Cost				1,829,000
J. Bata Ata Farm and Processing Center(4 new buildings)				
1. Land				-
2. Engineering Services				
a. Design				42,000
b. Supervision of Constr.				62,000
3. Construction				
a. Site Preparation				21,000
b. Access Roads				30,000
c. Buildings & Structures				
(1) Processing and Storage Bldg.	Each	1	500,000	500,000

(2) Drying Floor	Each	1	200,000	200,000
(3) Refrigerated Storage	Each	1	50,000	50,000
(4) Remodelled Storage	Each	1	50,000	50,000
(5) Class II Quarters	Each	1	100,000	100,000
(6) Class III Quarters	Each	2	140,000	280,000
d. Water Supply				90,000
e. Sewerage				-
f. Electricity Supply				24,000
g. Fencing				30,000
				<hr/>
4. Total Cost				1,398,000
K. Paranthan Processing Center and Killinochchi Farm (2 buildings)				
1. Land				-
2. Engineering Services				
a. Design				14,000
b. Supervision of Constr.				20,000
3. Construction Services				
a. Site Preparation				7,000
b. Access Roads				20,000
c. Buildings & Structures				
(1) Refrigerated Storage	Each	1	50,000	50,000
(2) Remodelled Storage	Each	1	50,000	50,000
(3) Class II Quarters	Each	1	100,000	100,000
(4) Class III Quarters	Each	1	140,000	140,000
d. Water Supply				6,000
e. Sewerage				-
f. Electricity Supply				16,000
g. Fencing				20,000
				<hr/>
4. Total Cost				443,000
L. Nikaweratiya Processing Center (1 new building)				
1. Land				-
2. Engineering Services				
a. Design				30,000
b. Supervision of Constr.				45,000
3. Construction Services				
a. Site Preparation				15,000
b. Access Roads				10,000
c. Buildings & Structures				
(1) Processing and Storage Bldg.	Each	1	500,000	500,000

(2) Remodelled Storage	Each	1	50,000	50,000
(3) Drying Floor	Each	1	200,000	200,000
(4) Refrigerated Storage	Each	1	50,000	50,000
d. Water Supply				3,000
e. Sewerage				-
f. Electricity Supply				8,000
g. Fencing				10,000

4. Total Cost				921,000
M. Total Estimated 1984 Cost of Construction			Rs. 24,390,000	
Equivalent U.S Dollars (U.S.= Rs.25)				\$975,600
N. Contingencies at 10 percent				\$97,560
O. Inflation of 10 percent compounded annually (32%)				\$312,190
1st year	Rs.858,000 x 10%	=	Rs. 85,800	
2nd year	Rs.7,690,895 x 21%	=	1,615,100	
3rd year	Rs.10,962,377 x 33%	=	3,617,600	
4th year	Rs.4,122,597 x 46%	=	1,896,400	
5th year	Rs.756,131 x 61%	=	461,200	

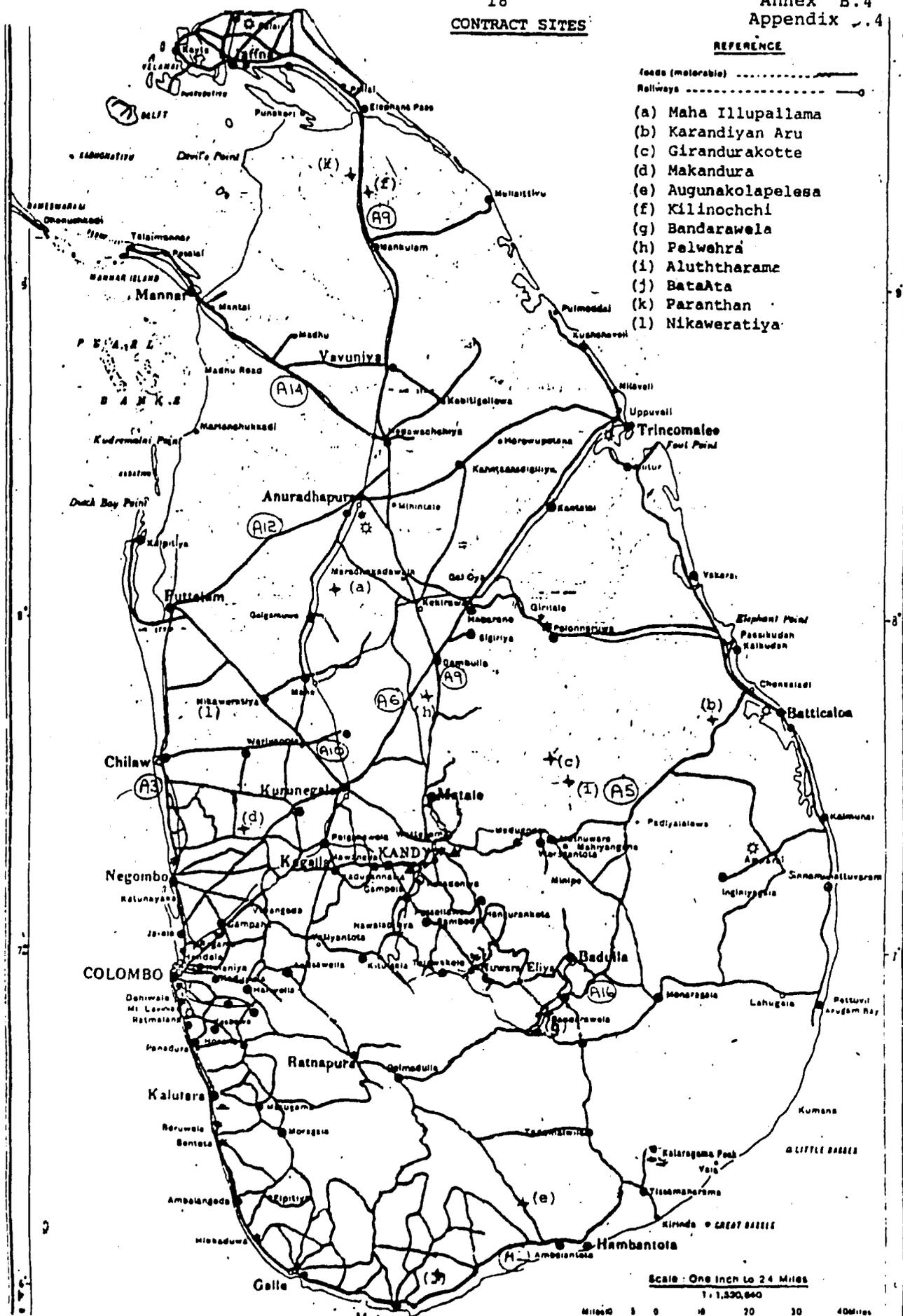
			7,676,100	
P. Total Estimated Project Cost of Construction				\$1,385,350
Q. Estimated Cost to USAID and GSL (Rs.25/\$1)				
	USAID	GSL		TOTAL
	US\$	Rupees		US\$
	75%	25%		100%
	-----	-----		-----
Engineering	64,260	535,500		85,680
Construction	667,440	5,562,000		889,920
Contingency	73,170	609,750		97,560
Inflation	234,143	1,951,175		312,190
	-----	-----		-----
Total	1,039,013	8,658,425		1,385,350
		(\$346,337)		

Illustrative Contract Schedule for Engineering and Construction

	1st Year	2nd Year	3rd Year	4th Year	5th Year
CONTRACT FOR ENGINEERING SERVICES					
(a) Prequalification	█				
(b) Award	█				
Design of Research Centers and Processing Center	█				
CONSTRUCTION CONTRACT					
(a) Prequalification		█			
(b) Award		█			
Contract: Sites Schedule					
) Mahallupallama R.C.		█	█	█	
) Karandiyana R.C.		█	█	█	
) Girandurakotte R.C.			█	█	
) Makandura R.C.			█	█	
) Augunakolapelessa R.C.			█	█	
) Killinochi R.C.				█	█
) Bandarawela R.C.					█
) Pelawehra F & P.C.		█	█		
) Aluththarama F & P.C.		█	█		
) Bataata F & P.C.		█	█		
) Paranthan F & P.C.			█	█	
) Nikaweratiya P. C.			█	█	

REFERENCE

- roads (motorable) -----
 Railways -----
- (a) Maha Illupallama
 - (b) Karandiyan Aru
 - (c) Girandurakotte
 - (d) Makandura
 - (e) Augunakolapelessa
 - (f) Kilinochchi
 - (g) Bandarawela
 - (h) Palwehra
 - (i) Aluththarame
 - (j) Bataata
 - (k) Paranthan
 - (l) Nikaweratiya



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TABLE 1
AID EXPENDITURES BY CALENDAR YEAR

	1985	1986	1987	1988	1989	1990	1991	1992	Total
<u>USAID Grant Funds</u>									
<u>Technical Assistance</u>									
Long-Term	255.0	728.4	509.9	145.7	36.4	-	-	-	1675.4
Short-term	195.0	300.0	300.0	270.0	150.0	225.0	-	-	1440.0
Subtotal	450.0	1028.4	809.9	415.7	186.4	225.0	-	-	3115.4
<u>Training</u>									
Long-term -U.S.	72.0	313.2	340.2	205.2	72.0	7.2	-	-	1009.8
Long-term - 3rd Country	14.0	59.4	75.6	56.2	26.7	4.3	-	-	236.2
Short-term - U.S.	57.8	71.4	34.0	51.0	17.0	10.2	-	-	241.4
Short-term - 3rd Country	47.0	102.0	107.0	84.0	72.0	50.0	20.0	-	482.0
In-country Seminars & Workshops	10.0	-	-	-	5.0	-	-	-	15.0
Subtotal	200.8	546.0	556.8	396.4	192.7	71.7	20.0	-	1984.4
<u>Evaluation</u>	-	-	20.0	45.0	-	-	-	60.0	125.0
<u>Social & Economic Research</u>	50.0	10.0	30.0	40.0	20.0	-	50.0	-	200.0
<u>Central Project Cost Sharing</u>	20.0	20.0	20.0	20.0	20.0	20.0	20.0	-	140.0
Total Before Contingency & Inflation	720.8	1604.4	1436.7	917.1	419.1	316.7	90.0	60.0	5564.8
<u>Contingency (6%)</u>	43.2	96.4	86.2	55.0	25.1	19.0	5.4	3.6	333.9
<u>Inflation (10% Compounded)</u>	72.1	336.9	475.5	425.6	255.9	244.4	85.4	68.5	1964.3
Total USAID Grant Expenditures	836.1	2037.7	1998.4	1397.7	700.1	580.1	180.8	132.1	7863.0
<u>USAID Loan Funds</u>									
<u>Commodities</u>									
Vehicles	625.4	-	-	-	-	-	-	-	625.4
Equipment	749.0	452.9	-	149.8	-	-	-	-	1351.7
Supplies/Materials	5.0	96.8	-	-	-	-	-	-	101.8
Subtotal	1379.4	549.7	-	149.8	-	-	-	-	2078.9
<u>Facilities</u>									
Construction/Renovation	25.7	230.7	328.9	123.7	22.7	-	-	-	731.7
Total Before Contingency & Inflation	1405.1	780.4	328.9	273.5	22.7	-	-	-	2810.6
<u>Contingency (6%)</u>	84.3	46.8	19.7	16.4	1.4	-	-	-	168.6
<u>Inflation (10% Compounded)</u>	140.5	164.6	109.9	127.9	14.9	-	-	-	557.8
Total USAID Loan Expenditures	1629.9	991.8	458.5	417.8	39.0	-	-	-	3537.0
Total USAID Project Expenditures	2466.0	3029.5	2456.9	1815.5	739.1	580.1	180.8	132.1	11400.0

Annex B.5
(Table 1-5)

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TABLE 2
GSL EXPENDITURES BY CALENDAR YEAR
(\$000)

	1985	1986	1987	1988	1989	1990	1991	1992	Total
<u>Technical Assistance</u>									
Office Space & Supplies	17.6	41.6	32.3	15.5	6.8	7.8	-	-	121.6
<u>Training</u>									
In-Country - PCIA	0.3	1.4	1.6	1.1	0.5	0.1	-	-	5.0
In-Country - Workshops/Seminars	2.0	-	-	-	2.0	-	-	2.0	6.0
Subtotal	2.3	1.4	1.6	1.1	2.5	0.1	-	2.0	11.0
<u>Commodities</u>									
Clearance, Storage, Inland Transport, etc.	-	17.7	5.0	-	10.1	-	-	-	32.8
<u>Facilities</u>									
Construction/Renovation	8.6	76.9	109.6	41.2	7.6	-	-	-	243.9
Furnishings	-	5.8	7.8	4.8	-	-	-	-	18.4
Subtotal	8.6	82.7	117.4	46.0	7.6	-	-	-	262.3
<u>Personnel</u>									
Salaries	112.0	164.8	173.8	162.4	147.3	136.9	134.6	135.7	1,167.5
Travel & Allowances	28.4	42.1	45.0	46.5	49.6	51.9	52.9	55.0	371.4
Subtotal	140.4	206.9	218.8	208.9	196.9	188.8	187.5	190.7	1,538.9
<u>Operations & Maintenance</u>									
Maintenance - Vehicles	-	20.5	16.8	23.6	28.8	28.9	28.9	28.9	176.4
Maintenance - Equipment	-	9.5	21.5	23.3	28.1	28.1	28.1	28.1	166.7
Maintenance - Buildings	-	-	11.2	26.0	32.8	32.8	32.8	32.8	168.4
Electricity & Fuel Costs	19.0	65.5	71.5	82.4	106.7	107.0	107.0	107.0	666.1
Subtotal	19.0	95.5	121.0	155.3	196.4	196.8	196.8	196.8	1,177.6
<u>Evaluation</u>									
	-	-	0.7	1.0	1.9	-	-	3.3	6.9
Total before Contingency & Inflation	187.9	445.8	496.8	427.8	422.2	393.5	384.3	392.8	3,151.1
Contingency (5%)	9.4	22.3	24.8	21.4	21.1	19.7	19.2	19.6	157.5
Inflation (10% Compounded)*	18.8	93.6	164.4	198.5	257.8	303.6	365.5	449.2	1,851.4
Total GSL Project Expenditures	216.1	561.7	686.0	647.7	701.1	716.8	769.0	861.6	5,160.0

* Although inflation is not normally part of GSL budget considerations at this stage of project design, we have included it to prevent understatement of GSL project contributions. Its omission would also distort comparisons to USAID project contributions.

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TABLE 3
SUMMARY OF PROJECT INPUTS/COMPONENTS
(\$000)

INPUTS	COMPONENTS				TOTAL
	RESEARCH	SEED PRODUCTION	TECHNOLOGY TRANSFER	PROJECT MANAGEMENT	
AID GRANT FUNDS					
Technical Assistance	1,401.2	741.4	390.0	582.8	3,115.4
Training	1,248.4	324.4	401.6	10.0	1,984.4
Evaluation	-	-	-	125.0	125.0
Social & Economic Research	200.0	-	-	-	200.0
Central Project Cost Sharing	-	-	-	140.0	140.0
SUBTOTAL	<u>2,849.6</u>	<u>1,065.8</u>	<u>791.6</u>	<u>857.8</u>	<u>5,564.8</u>
Contingency	171.0	63.9	47.5	51.5	333.9
Inflation	981.8	377.2	256.5	348.8	1,964.3
TOTAL AID GRANT FUNDS	<u>4,002.4</u>	<u>1,506.9</u>	<u>1,095.6</u>	<u>1,258.1</u>	<u>7,863.0</u>
AID LOAN FUNDS					
Commodities	700.3	1,013.3	332.0	33.3	2,078.9
Facilities	477.1	210.8	43.8	-	731.7
SUBTOTAL	<u>1,177.4</u>	<u>1,224.1</u>	<u>375.8</u>	<u>33.3</u>	<u>2,810.6</u>
Contingency	70.6	73.5	22.5	2.0	168.6
Inflation	244.8	251.7	47.3	14.0	557.8
TOTAL AID LOAN FUNDS	<u>1,492.8</u>	<u>1,549.3</u>	<u>445.6</u>	<u>49.3</u>	<u>3,537.0</u>
TOTAL AID FUNDS	<u>5,495.2</u>	<u>3,056.2</u>	<u>1,541.2</u>	<u>1,307.4</u>	<u>11,400.0</u>
GSL FUNDS					
Technical Assistance	55.1	28.1	13.5	24.9	121.6
Training	8.7	.3	2.0	-	11.0
Commodities	12.6	15.5	4.3	.4	32.8
Facilities	173.5	74.2	14.6	-	262.3
Personnel	996.7	161.2	319.9	61.1	1,538.9
Operations & Maintenance	483.3	482.1	192.9	19.3	1,177.6
Evaluation	-	-	-	6.9	6.9
SUBTOTAL	<u>1,729.9</u>	<u>761.4</u>	<u>547.2</u>	<u>112.6</u>	<u>3,151.1</u>
Contingency	86.5	38.1	27.4	5.5	157.5
Inflation	1,014.5	454.6	319.7	62.6	1,851.4
TOTAL GSL FUNDS	<u>2,830.9</u>	<u>1,254.1</u>	<u>894.3</u>	<u>180.7</u>	<u>5,160.0</u>
GRAND TOTAL-ALL PROJECT FUNDS	<u>8,326.1</u>	<u>4,310.3</u>	<u>2,435.5</u>	<u>1,488.1</u>	<u>16,560.0</u>
% of TOTAL PROJECT FUNDS	50.3	26.0	14.7	9.0	100.0

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TABLE 4
NEW (PROJECT - GENERATED) RECURRENT COSTS - GSL

(\$000)

	1985	1986	1987	1988	1989	1990	1991	1992	TOTAL
<u>PERSONNEL</u>									
SALARIES	20.3	41.2	42.4	43.5	44.3	45.3	46.4	47.5	330.9
TRAVEL & ALLOWANCES	20.7	34.4	37.3	38.8	41.9	44.2	45.2	47.3	309.8
SUBTOTAL	<u>41.0</u>	<u>75.6</u>	<u>79.7</u>	<u>82.3</u>	<u>86.2</u>	<u>89.5</u>	<u>91.6</u>	<u>94.8</u>	<u>640.7</u>
<u>OPERATIONS & MAINTENANCE</u>									
MAINTENANCE - VEHICLES	-	20.5	16.8	23.6	28.8	28.9	28.9	28.9	176.4
MAINTENANCE - EQUIPMENT	-	9.5	21.5	23.3	28.1	28.1	28.1	28.1	166.7
MAINTENANCE - BUILDINGS	-	-	11.2	26.0	32.8	32.8	32.8	32.8	158.4
ELECTRICITY & FUEL COSTS	19.0	65.5	71.5	82.4	106.7	107.0	107.0	107.0	666.1
SUBTOTAL	<u>19.0</u>	<u>95.5</u>	<u>121.0</u>	<u>155.3</u>	<u>196.4</u>	<u>196.8</u>	<u>196.8</u>	<u>196.8</u>	<u>1,177.6</u>
TOTAL (BEFORE INFLATION)	<u>60.0</u>	<u>171.1</u>	<u>200.7</u>	<u>237.6</u>	<u>282.6</u>	<u>285.3</u>	<u>288.4</u>	<u>291.6</u>	<u>1,818.3</u>
<u>INFLATION (10% COMPOUNDED)</u>	<u>6.0</u>	<u>35.9</u>	<u>66.2</u>	<u>109.3</u>	<u>172.4</u>	<u>220.5</u>	<u>274.0</u>	<u>333.4</u>	<u>1,217.7</u>
TOTAL NEW RECURRENT COSTS	66.0	207.0	266.9	346.9	455.0	506.8	562.4	625.0	3,036.0
	====	=====	=====	=====	=====	=====	=====	=====	=====

Annex B.5

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TABLE 5

PROJECTED AID OBLIGATIONS BY FISCAL YEAR (in \$000)

	1984	1985	1986	Future Years
GRANT	790	1,750	1,460	3,900
LOAN	1,960	1,540	-	-
TOTAL	2,750	3,290	1,460	3,900

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Sri Lanka Rice Production, 1973-82

<u>Year</u>	<u>Gross Production (Paddy, '000 MT)</u>	<u>Yield, MT/ha.</u>
1973	1,312	1.95
1974	1,602	2.01
1975	1,154	1.93
1976	1,253	1.97
1977	1,677	2.14
1978	1,890	2.25
1979	1,917	2.43
1980	2,133	2.60
1981	2,233	2.98
1982	2,159	3.21

Source: Department of Agriculture Records, 1973-1982

SFC ACREAGE & PRODUCTION, 1971-82

Year	Maize		Finger Millet		Cowpea		Blackgram	
	Acres	Production ('000 m.t)	Acres	Production ('000 m.t)	Acres	Production ('000 m.t)	Acres	Production ('000 m.t.)
1971	63,541	16.4	52,303	12.6	2,387	0.5	-	-
1972	40,165	13.8	13,575	4.3	1,147	0.5	1,220	0.4
1973	59,685	13.6	21,023	5.0	3,310	0.6	1,122	0.4
1974	95,128	23.8	71,547	15.7	7,395	2.4	3,439	0.7
1975	98,970	34.6	66,289	20.6	21,578	7.6	5,026	1.0
1976	75,092	31.2	49,019	15.5	47,516	12.0	12,579	2.5
1977	96,770	42.0	63,245	23.3	74,537	21.3	34,279	11.7
1978	70,718	33.8	43,605	14.7	68,210	22.6	34,743	8.7
1979	58,333	26.0	26,770	10.8	74,791	18.2	21,590	6.0
1980	59,701	31.4	19,841	6.7	63,113	23.5	20,652	5.5
1981	69,403	35.3	32,802	11.7	94,271	39.4	24,843	7.4
1982	83,993	38.2	35,028	11.7	84,169	33.5	23,612	8.2

Source: 1971-1982, Department of Agriculture

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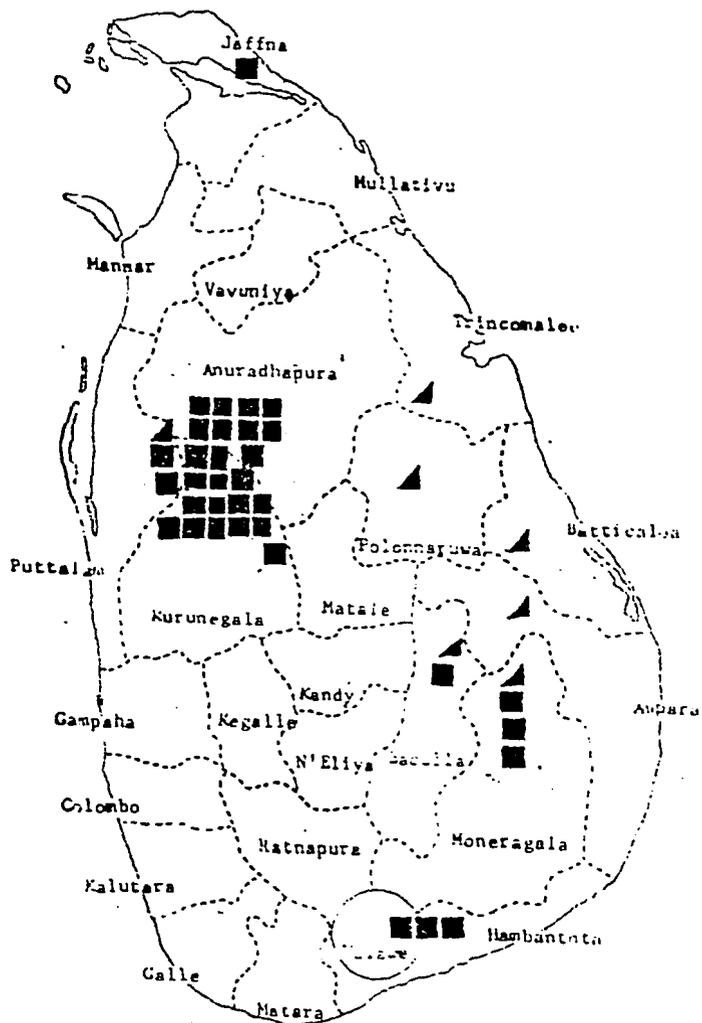
ANNUAL ACREAGE & PRODUCTION (Continued)

Year	Greengram		Groundnut		Soyabean		Sesame		Chillies		Onion	
	Acres	Production ('000 m.t)	Acres	Production ('000 m.t.)	Acres	Production (m.t.)	Acres	Production ('000 m.t.)	Acres	Production ('000 m.t)	Acres	Production ('000 m.t.)
1971	6,054	1.3	12,697	4.9	NA	NA	28,237	4.4	43,957	7.4	14,263	43.6
1972	7,053	1.4	11,950	5.5	116	25.2	14,678	5.2	59,778	12.1	14,835	60.8
1973	13,038	3.0	15,352	5.7	437	226.8	16,928	2.9	90,151	19.6	17,727	69.6
1974	26,417	5.9	19,078	7.5	3242	998.2	32,102	5.0	102,672	17.6	16,403	72.0
1975	22,866	6.0	19,209	7.6	2818	1158.1	31,422	6.3	81,640	16.4	15,984	74.2
1976	20,667	5.1	16,615	6.1	1780	711.2	46,938	8.6	107,088	32.9	19,570	78.4
1977	30,509	7.8	16,012	5.7	2502	1116.4	33,464	7.4	108,908	31.3	20,775	68.2
1978	30,150	8.3	20,457	7.5	4770	2349.2	41,952	10.0	83,588	28.3	16,068	74.6
1979	30,124	9.7	12,484	5.4	3016	1323.2	41,292	17.2	49,750	21.9	14,961	63.5
1980	35,076	12.9	23,566	14.1	2696	1083.0	77,851	23.6	62,657	25.6	18,697	80.3
1981	44,912	18.9	29,807	14.5	5466	2387.6	61,934	14.0	59,563	21.2	20,447	93.1
1982	51,379	17.2	35,570	13.8	20205	10048.2	80,214	23.3	68,755	24.7	20,712	96.2

EXTENT CULTIVATED : COWPEA

Maha 81/82

■ 500 ha



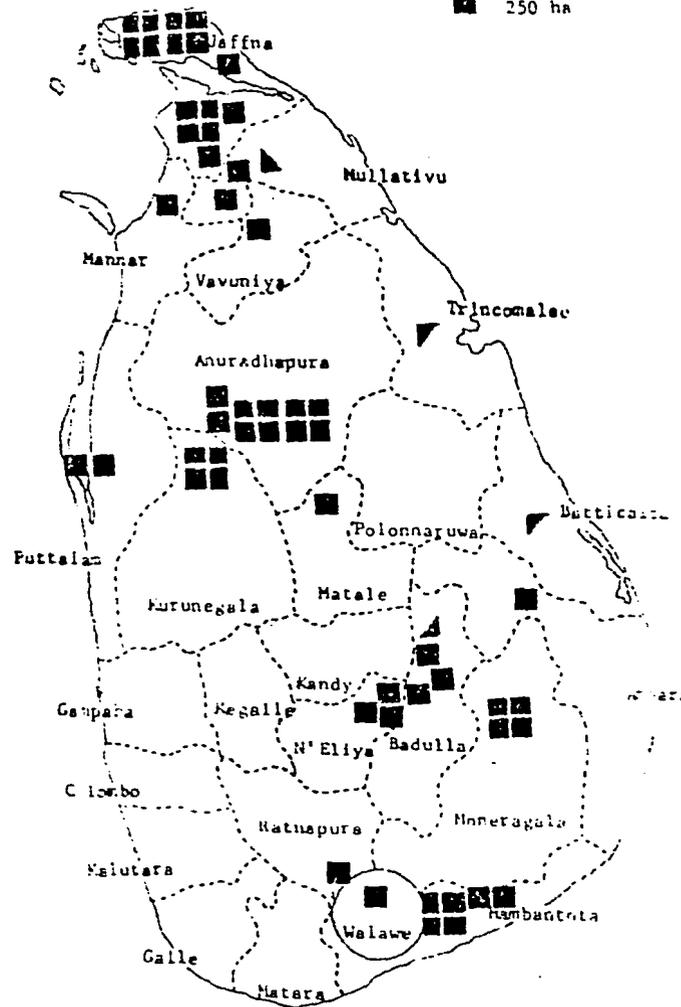
SRI LANKA : Maha 19261

Yala 13190

EXTENT CULTIVATED : CHILLIES

MAHA 1981/82

■ 250 ha



SRI LANKA : Maha 81/82 15361 ha

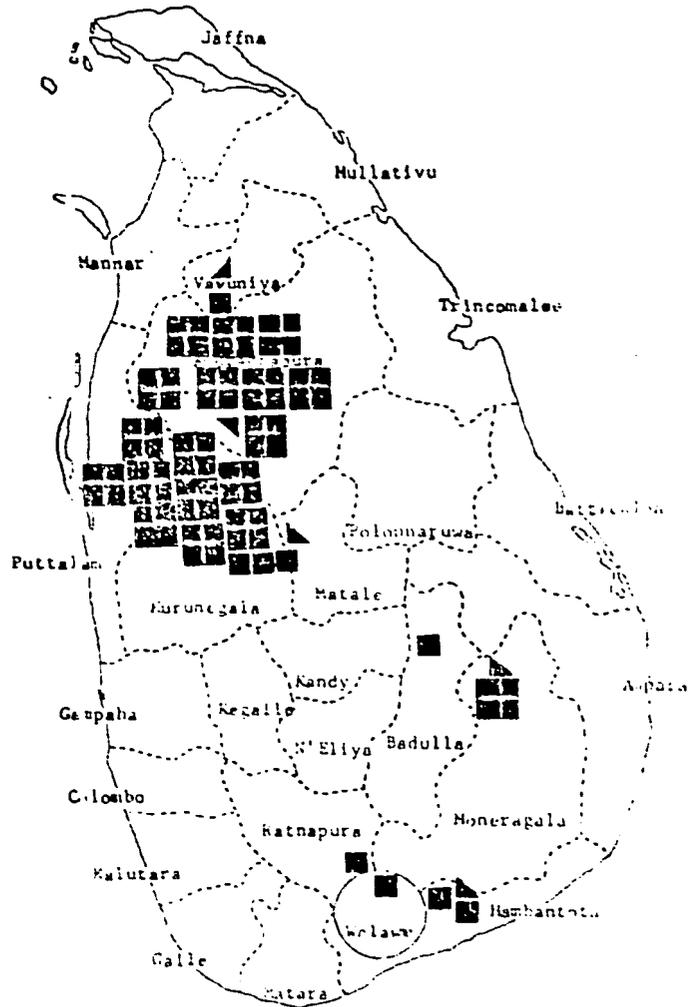
Yala 82 14341 ha

157

EXTENT CULTIVATED : SESAME

Yala 82

■ 250 ha

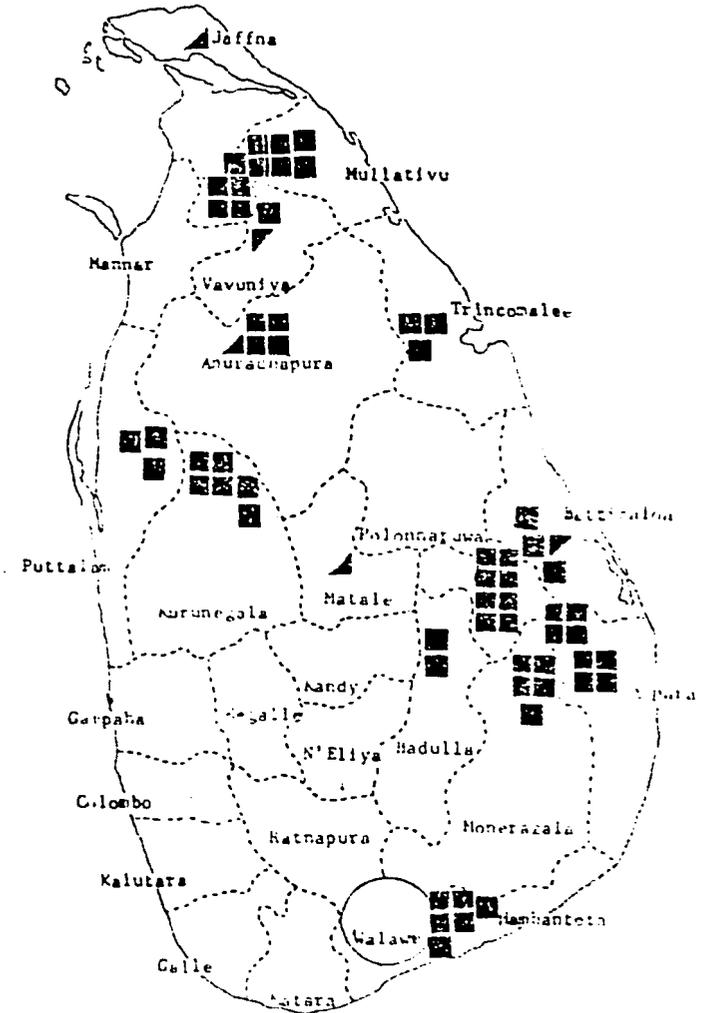


SRI LANKA : Maha 4345
Yala 21011

EXTENT CULTIVATED : GROUNDNUT

Maha 51/E2

■ 250 ha



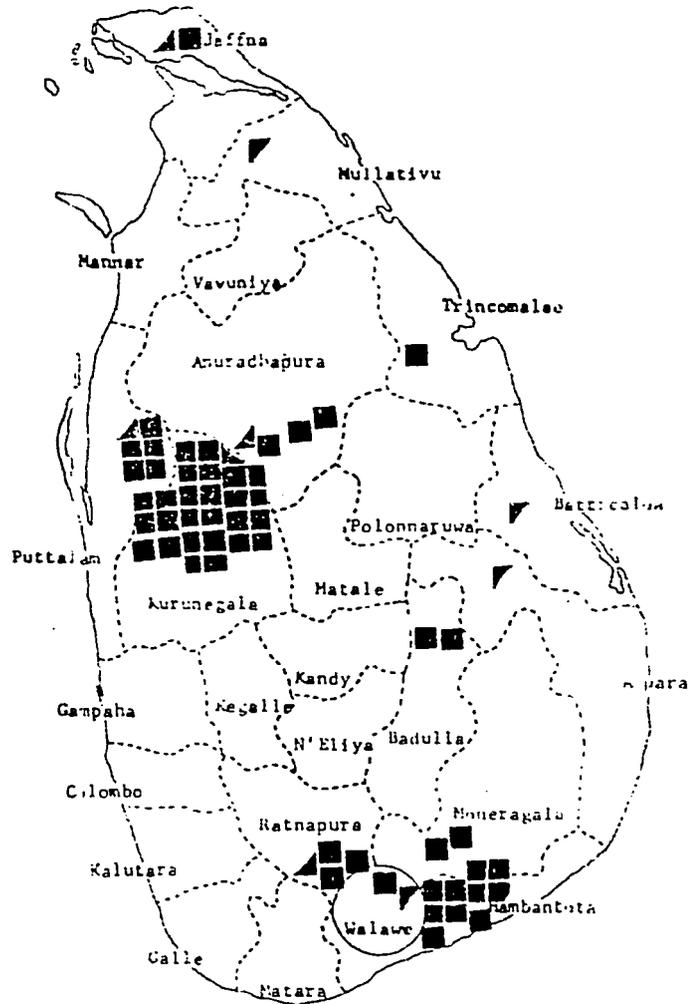
SRI LANKA : Maha 15065
Yala 3144

153

EXTENT CULTIVATED : GREEN GRAM

Maha 81/82

■ 250 ha

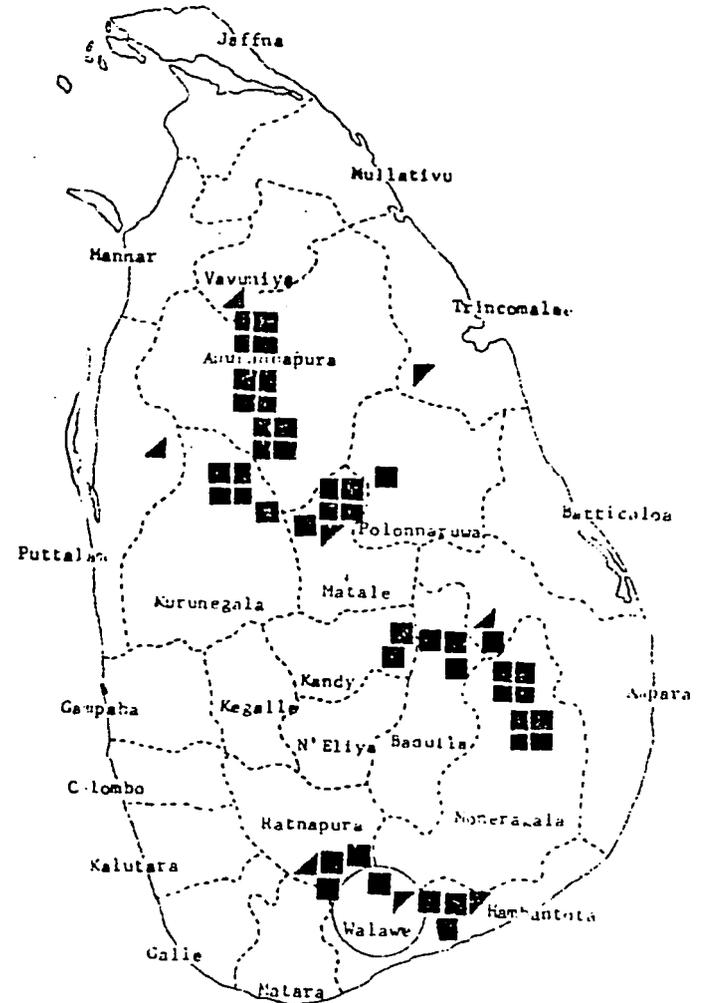


SRI LANKA : Maha 14007
Yala 8264

EXTENT CULTIVATED : KURAKKAN
(Finger Millet)

Maha 81/82

■ 250 ha

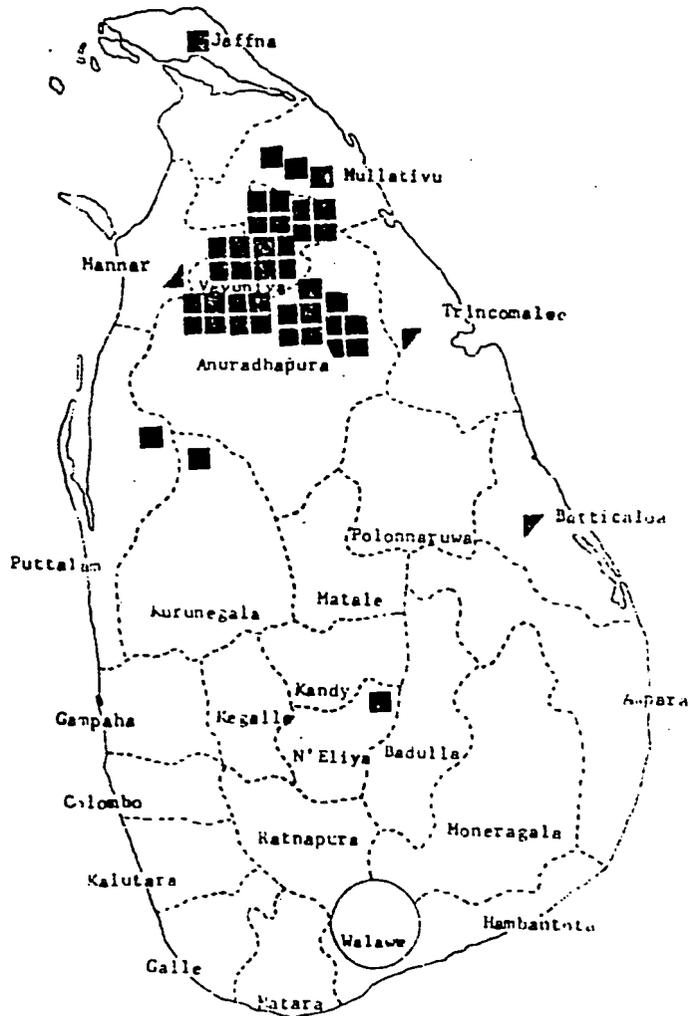


SRI LANKA : Maha 12675
Yala 1784

EXTENT CULTIVATED : BLACK GRAM

Maha 81/82

250 ha



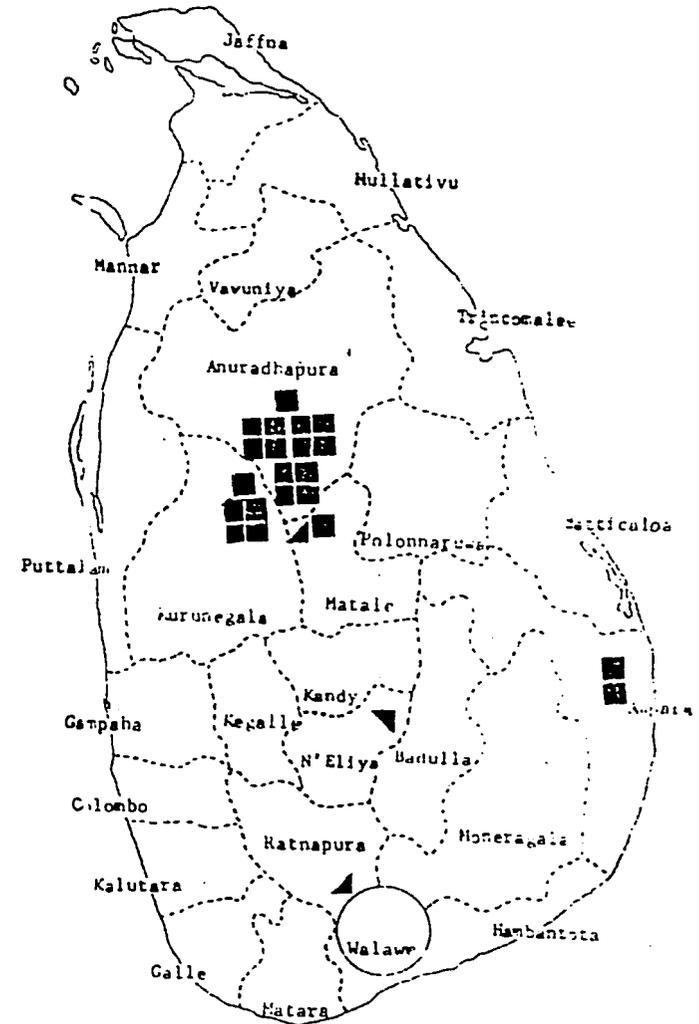
SRI LANKA : Maha 105354

Yala 418

EXTENT CULTIVATED : SOYA BEA

Maha 82/82

250 ha



SRI LANKA : Maha 6074

Yala 1494

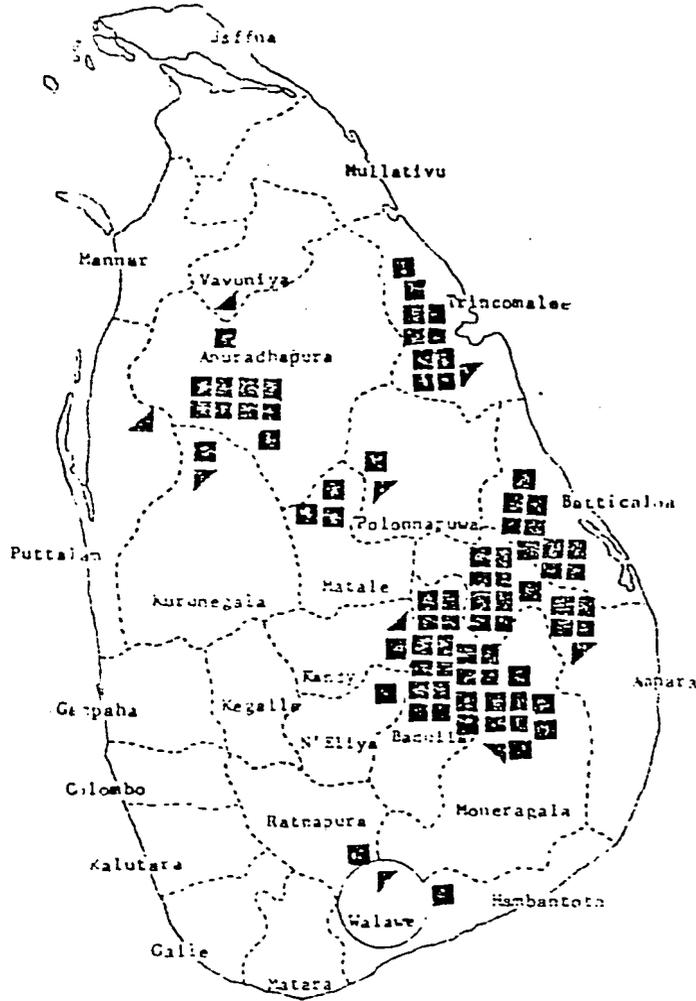
155

Extent of SFC Cultivation by Crop*

EXTENT CULTIVATED : MAIZE

Maha, 81/82

■ 500 ha

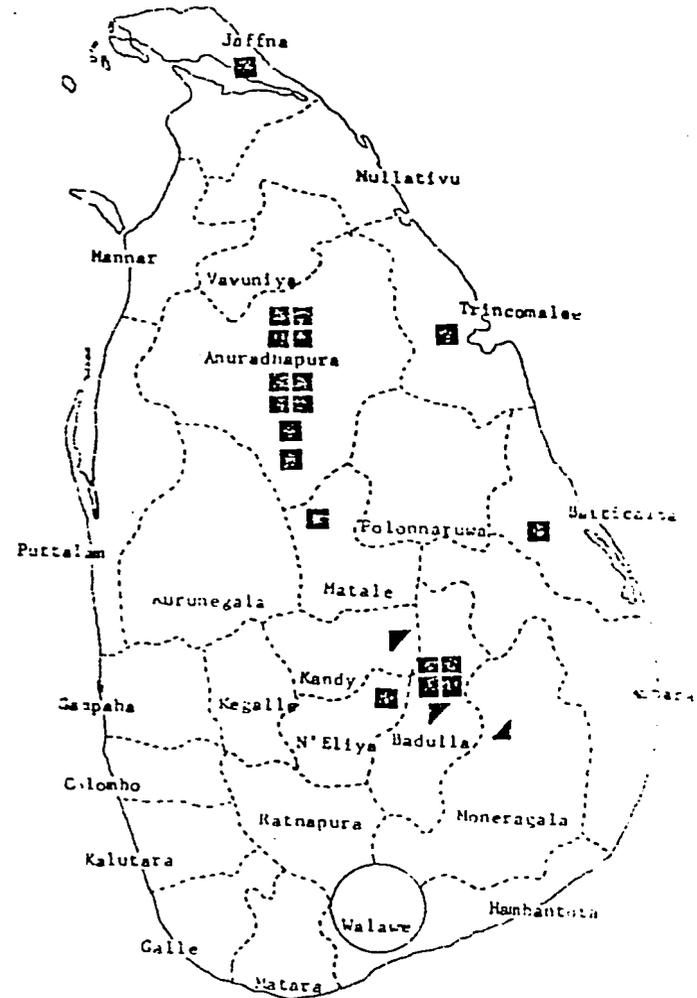


SRI LANKA : Maha 81/82 33530 ha
Yala 1209 ha

EXTENT CULTIVATED : SORGHUM

Maha 81/82

■ 10 ha



SRI LANKA : Maha 216
Yala 18

* Based on statistics from Agricultural Implementation Programme
(Ministry of Agricultural Development and Research)

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TECHNICAL ASSISTANCE PLAN (Person Months)

Field	1985	1986	1987	1988	1989	1990	1991	1992	Total
<u>Long-Term</u>									
Research									
Farming Systems Research/ Chief-of-Party	9	12	12	12	3	-	2)		48
Agronomy	3	12	9	-	-	-			24
Soil & Water Management	3	12	3	-	-	-			18
Production/Marketing Econ	3	12	9	-	-	-			24
Seed Specialist	3	12	9	-	-	-			24
	<u>21</u>	<u>60</u>	<u>42</u>	<u>12</u>	<u>3</u>	<u>0</u>			<u>138</u>
<u>Short-Term</u>									
Research 1)	7	6	7	7	5	8			40
Seeds	4	6	5	5	5	5			30
Technology Transfer 3)	2	8	8	6	-	2			26
	<u>13</u>	<u>20</u>	<u>20</u>	<u>18</u>	<u>10</u>	<u>15</u>			<u>96</u>

1) To be provided to Research Division and Division of Agricultural Economics and Projects.

2) While four years of a Farming Systems Research Advisor/Contract Chief-of-Party are programmed, the need to extend services for an additional period will be reviewed during the mid-term project evaluation in 1988. The project budget includes funds to cover such an extension, if recommended by the evaluation.

3) To be provided to two DOA Divisions: Extension, and Education and Training.

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	<u>21</u>	<u>60</u>	<u>42</u>	<u>12</u>	<u>3</u>	<u>0</u>			<u>138</u>
<u>Short-Term</u>									
Research 1)	7	6	7	7	5	8			40
Seeds	4	6	5	5	5	5			30
Technology Transfer 3)	2	8	8	6	-	2			26
	<u>13</u>	<u>20</u>	<u>20</u>	<u>18</u>	<u>10</u>	<u>15</u>			<u>96</u>

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TRAINING PLAN

A. Long-term Training

Based on a careful analysis of institutional requirements to upgrade and expand Sri Lanka's capability in the subsidiary field crops, a total of 61 advanced degrees are planned under the project. Long-term training will be provided in the U.S., third countries, and, to the maximum extent feasible, at Sri Lanka's University of Peradeniya (a minimum 25 percent is programmed at the latter). Long-term training by field and number of person months per year is shown in Table 2 and described in more detail below.

1. Research

The Research Division has a total cadre of 346 Research or Experimental Officers (minimum of B.Sc.). Of these, 108 hold advanced degrees and another 48 are now in advanced degree training. The distribution (by location and field of specialization) is shown in Table 1. Of the 190 remaining, 12 are presently scheduled for advanced training under other projects. Research Officers with advanced degrees, now engaged primarily in SFC-related work, total 46. Of the 48 staff now in training, roughly half will be available for SFC work on their return. An additional 17 Research Officers will be hired early in project implementation, specifically for SFC-related work.

The nature of agricultural research is such that a master's degree is considered the minimum qualification for an effective Research Officer, and the long-term goal of the DOA is to upgrade all Research Officers to at least this level. In order to implement the enhanced SFC research program, the Research Division has estimated a minimum requirement of an additional 26 advanced degrees for Research Officers. This number was reviewed and endorsed by the project design team. The proposed fields of specialization are as follows:

	<u>Ph.D</u>	<u>M.Sc. or M.Phil.</u>
Plant Breeding	2	5
Entomology	2	3
Pathology	1	2
Soil Microbiology	-	3
Food Science	-	2
Physiology	-	3
Soil & Water Management	3	1
Weed Science	-	2
	<u>5</u>	<u>21</u>

The 26 trainees constitute seven percent of the present Research Officer cadre, or 14 percent of those with no advanced academic training. With 17 additional staff planned, minimum negative impact on on-going programs is anticipated while the officers are in training status.

TABLE 1

RESEARCH DIVISION: DISTRIBUTION OF PROFESSIONAL STAFF WITH
 ADVANCED DEGREES, LOCATION (RRC)

Specialization	MI	KA	APL	MAK	KIL	GIR	BAN	HQ	OTHER	TOTAL
Entomology	1	-	-	1	-	-	-	-	5	7
Agronomy	8	3	3	1	-	1	3	-	9	28
Crop Physiology	-	-	-	-	-	-	-	-	1	1
Pathology	-	-	-	-	-	-	1	-	3	4
Soil & Water Management	1	-	1	-	1	-	-	-	1	4
Crop Science	-	-	-	-	-	-	1	-	1	2
Soil Science	2	1	1	-	-	-	1	3	5	13
Soil Physics	-	-	-	-	-	-	-	1	-	1
Hydrology	-	-	-	-	-	-	-	1	-	1
Cropping Systems	-	-	-	-	1	-	-	-	-	1
Food Science	-	-	-	-	-	-	-	-	4	4
Plant Breeding	1	1	1	-	-	-	-	-	3	6
Soil Microbiology	-	-	-	-	-	-	1	-	2	3
Other	1	2	-	1	1	-	-	1	27	33
Currently in advanced academic training (overseas) Ph.D. or M.Sc.	14	7	6	3	3	1	7	6	61	108
	8	2	7	1	5	0	3	0	22	48
	22	9	13	4	8	1	10	6	83	156

Source: Research Division Records

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The Division of Agricultural Economics and Projects (DAEP) currently has a professional staff of 17, covering all crops including the SFC. Of these, two hold Ph.D.'s and another seven hold M.Sc.'s, with three more now in master's level training. The DAEP plans to add six additional agricultural economists to its field staff over the next two years, primarily to undertake project-related work or release others for this work. The unsupervised nature of most of the work undertaken by the DAEP field staff virtually dictates the need for advanced academic training. Therefore, six advanced degrees are planned under the auspices of this project as follows:

	<u>Ph.D</u>	<u>M.Sc. or M.Phil.</u>
Agricultural Policy	1	-
Production Economics	1	-
Econometrics	-	1
Farm Management	-	2
Marketing	-	1
	<u>2</u>	<u>4</u>
	===	===

Project plans call for the provision of the required social science input through the Agrarian Research and Training Institute, University of Peradeniya or other local sources. The farming systems research work calls for fairly specialized skill levels. Initially, these needs will be met by the part-time assignment of social scientists, but, to facilitate a sustained capability to provide the requisite level and quality of social science input over the life of the project and beyond, two advanced degrees (M.Sc.) in rural sociology or anthropology are included in the project.

2. Extension

The Extension Division has a total professional (agricultural) staff of approximately 3,600. The KVS' (village-level workers) and Agricultural Instructors make up the largest share of the total, with 2,700 and 600, respectively. The Subject Matter Officers (SMO's) add another 160. Of the total extension cadre, only 140 (Agricultural Officer rank and higher) have an academic degree of any sort; the number of advanced academic degree holders total 15, with none currently in training.

The project proposes to provide master's degrees for AO's in charge of segments (see Technical Analysis) where the SFC are currently produced, or could become important production areas, upgrading their analytical capabilities and potential effectiveness within the RTWG. Twenty degrees (one-sixth of the AO cadre) are planned in the following fields: rural sociology, communications, plant protection, and agronomy.

In Education and Training, key staff, as pointed out in the Technical Analysis, are the Subject Matter Specialists (SMS's). There are currently 15 SMS' attached to the In-Service Training Institutes (ISTI's); 10 of these are at the five ISTI now existing in the dry and intermediate zones. Of the 15 SMS', two have advanced degrees and another three are currently in training. Five new SMS positions are to be filled at the dry and intermediate zone ISTI's over the next few years. Master's degree training is planned for five SMS (25 percent of the expanded cadre) under the project. Planned fields of study are agronomy (specializing in SFC) and water management.

TABLE 2
LONG-TERM TRAINING: U.S. AND 3rd COUNTRY/SRI LANKA (PERSON MONTHS)*

Project Components			1985	1986	1987	1988	1989	1990	Total
<u>Research</u>									
<u>No. of People</u>									
2	(1)**	Plant Breeding, Ph.D	8	24	24	24	4	-	
5	(2)**	Plant Breeding, M.Sc.	12	36	36	24	12	-	
2	-	Entomology, Ph.D	-	12	24	24	2	6	
3	(2)**	Entomology, M.Sc.	4	16	20	12	12	8	
1	-	Pathology, Ph.D	-	12	12	12	6	-	
2	(1)**	Pathology, M.Sc.	4	12	12	12	8	-	
3	(2)**	Microbiology, M.Sc.	-	12	12	24	24	-	
2	(1)**	Food Science, M.Sc.	4	16	20	8	-	-	
3	-	Physiology, M.Sc.	4	24	20	12	12	-	
1	-	Soil & Water Management, M.Sc.	4	12	8	-	-	-	
2	(2)**	Weed Science, M.Sc.	4	12	20	12	-	-	
1	-	Agriculture Policy, Ph.D	-	12	12	12	6	-	
1	(1)**	Production Economics, Ph.D	4	12	12	12	2	-	
1	-	Econometrics, M.Sc.	-	4	12	8	-	-	
2	(1)**	Farm Management, M.Sc.	-	12	12	12	12	-	
1	-	Agriculture Marketing, M.Sc.	4	12	8	-	-	-	
2	-	Sociology/Anthropology, M.Sc.	4	16	20	4	-	-	
34	(13)**	Sub total	56	256	264	212	100	14	902
<u>Seed Improvement</u>									
1		Seed Technology, Ph.D	4	12	12	12	2	-	
1		Seed Technology, M.Sc.	-	-	-	12	12	-	
2		Sub total	4	12	12	24	14	-	42
<u>Technology Transfer(Extension)</u>									
5	(2)**	Rural Sociology, M.Sc.	12	36	36	24	12	-	
5	(2)**	Agr. Communications, M.Sc.	12	36	36	24	12	-	
5	-	Plant Protection, M.Sc.	-	12	36	36	24	12	
5	(3)**	Agronomists, M.Sc.	-	12	36	36	24	12	
5	(2)**	Water Management, M.Sc.	12	36	36	24	12	-	
25	(9)**	Sub total	36	132	180	144	84	24	600

imum use. to the extent feasible, will be made of the University of Peradeniya. A minimum of 25 percent of all long-term training
 to be programmed.
 rd Country Training.

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3. Seed Production

As described in the Technical Analysis, long-term training in seed technology is planned for two of the 14 Assistant Director of Agriculture in charge of seed production regions.

B. Short-term Training

Planned distribution of the proposed 553 person months of short-term training is shown in Table 3. Principal training venues will be the International Agricultural Research Centers; additional locations are referenced in the Project Description (Section III).

As discussed in the Project Description and Administrative Analysis, DDA management and administrative capability to carry out a sound, resource-effective and efficient SFC program is in need of strengthening. To meet this objective, the project will finance short-term training for three or four mid-to senior-level officers per year in management/administrative skills. The training will be provided in the U.S. (e.g., USDA's course on Managing Agricultural Research), Asian management institutes, and at such in-country training facilities as the Sri Lanka Institute of Development Administration, and may include visits to other Asian agricultural research facilities to observe their organizational arrangements and procedures for effective program management and administration.

Table 3
Short-term Training, U.S. and 3rd Countries (person months)

Project Component (by DOA Division)	1985 PM	1986 PM	1987 PM	1988 PM	1989 PM	1990 PM	1991 PM	1992 PM	Total PM
<u>S</u>									
Research	3	3	-	-	-	-	-	-	6
Economics*	6	3	3	3	3	3	-	-	21
Seeds	8	15	7	12	2	-	-	-	44
	<u>17</u>	<u>21</u>	<u>10</u>	<u>15</u>	<u>5</u>	<u>3</u>	-	-	71
<u>d Country</u>									
Research	10	30	40	34	30	26	20	-	190
Economics**	15	30	33	21	18	9	-	-	126
Seeds	6	15	8	11	9	7	-	-	56
Technology Transfer	16	27	26	18	15	8	-	-	110
Total	<u>47</u>	<u>102</u>	<u>107</u>	<u>84</u>	<u>72</u>	<u>50</u>	<u>20</u>	-	482

* Includes 3pm for sociologist in 1985 (non DOA).

** Includes 21 pm for sociologist over years 1985-88 (non DOA).

Note: Reference to "Economics" is to the Division of Agricultural Economics and Projects.
 Training in Technology Transfer will be provided to staff of two DOA Divisions:
 Extension, and Education and Training.

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COMMODITY PROCUREMENT PLAN, COMMODITY/EQUIPMENT LIST,
AND UTILIZATION PLAN

1. Responsible Agency

All procurement under the project will be the responsibility of the Department of Agriculture (DOA), with assistance, as needed, from the USAID commodity procurement specialist and the RCMO (Regional Commodities Management Office) in Bangkok. The Superintending Engineer, Machinery Research and Development, has been designated by the DOA as the official with overall responsibility for procurement actions; he will be assisted by an agricultural engineer, who will oversee the day-to-day management of commodity procurement, receipt and distribution.

2. Procurement Services Agent (PSA)

In view of the large and varied amount of anticipated purchases in the U.S., the DOA will select a professional U.S. PSA to undertake most off-shore procurement. The DOA will negotiate and conclude, subject to USAID approval, a procurement services contract with the selected PSA o/a November 1984. The DOA is aware that in order to select a PSA, it must first solicit offers from qualified firms, in accordance with AID regulations. Primary responsibility for monitoring the PSA contract will lie with the DOA, with every reasonable assistance extended by USAID.

3. Equipment List

Estimated equipment and commodity needs are identified in the attached list. As soon as practical, and assisted by technical assistance personnel, the DOA will prepare a detailed final listing of equipment to be procured during the first two years of the project, including a breakdown by annual requirements, probable source of purchases, estimated costs (including an allowance for inflation), and a utilization plan. For subsequent procurement actions through the PSA, detailed lists and specifications will be prepared by the DOA and approved by USAID, as required.

4. Source of Procurement

The authorized sources of procurement for this project are Code 941 and, subject to USAID waiver requirements, the host country. It is anticipated that most purchases can be made in these countries; Code 935 procurements will be made only if authorized by USAID on a case-by-case basis, and subject to waiver procedures.

5. Method of Procurement

Procurements will be accomplished in accordance with AID regulations and good commercial practices. As a matter of procedure, the following will be observed:

a) Selection of PSA

- Offers will be solicited from a short list of qualified firms made available by the RCMO.
- Offers will be jointly evaluated, on the basis of predetermined criteria, by the DOA and USAID.

- Award will be effected by a contract between the DOA and the PSA, prepared and executed with the assistance of the RCMO and approved by USAID.

b) Purchasing

- On the basis of the approved detailed equipment lists, the DOA will prepare and USAID will approve procurement requests to cover procurement to be made by the PSA. Approved procurement requests will be then issued to the PSA to initiate the procurement flow.
- To the extent permitted by applicable AID Handbook 11 requirements, informal competitive procurement procedures will be employed.
- All formal procurements not purchased through the PSA and having their source and origin in Code 899 countries will be executed through formal tender procedures. The DOA will prepare and execute such documents with USAID's prior approval. The evaluation of bids and issue of awards arising from such tenders will be made by the DOA with USAID's concurrence.
- Off-shore small value purchases will be executed using USAID's standard Purchase Order document, completed by the DOA. Such purchase orders will be issued after informal quotations have been evaluated and the lowest, most responsive bidder has been identified.
- In the case of local source and shelf item procurements, the DOA will conduct the procurement, subject to advance USAID approval and waiver requirements, in accordance with its own procurement rules and AID policy.
- When required, advertising of anticipated procurements will be handled by the selected PSA. For local and/or international procurement not handled by the PSA, advertising will be handled by the DOA in accordance with GSL procedures.
- Evaluation of offers will be submitted by the PSA to the DOA and USAID.
- Awards of procurement contracts for all U.S. source purchases will be made by the DOA within 30 calendar days of receipt of the PSA's evaluations, subject to subsequent USAID approval.
- The DOA will be responsible for proper receipt, port clearances, inland transport, and expeditious utilization or storage of items purchased.

6. Payment

Responsibility for payments will be with the Controller, USAID/Colombo. The Controller will periodically establish Direct Letters of Commitment through which all U.S source purchases and the PSA's fee will be paid. Payments for all non-U.S. purchases, except as noted below, will also be made by the Controller as follows:

- a) In the case of local procurement, upon presentation of seller's invoice, showing items, price and origin, with acknowledgement of receipt and DOA's stock book number, signed by the DOA's commodity procurement coordinator.
- b) In the case of other non-U.S. procurement, upon presentation of:
 - pre-paid on-board bill of lading;
 - copy of packing list;
 - copy of supplier's invoice;
 - certificate of source and origin;
 - insurance certificate;
 - supplier's certificate and agreement with A.I.D. for project commodities (Form AID 1450-4); and,
 - voucher (Standard Form 1034).

7. Delivery

All goods ordered by the PSA will be on the basis of FOB/FAS port of exit. Shipping, in accordance with AID regulations, will be arranged by the PSA. The PSA will be required to obtain "all risk" marine insurance in the amount of 120 percent of the C&F cost of the goods. Air freight shipments, when needed and/or more economical, will be approved in advance by USAID.

8. Marking

The DOA is aware of AID's marking requirements and will enforce them in all procurement actions.

9. Receipt and Utilization

The DOA will be responsible for monitoring arrivals and clearing goods from Customs. Goods will be received at central DOA stores in Colombo, and inspected, distributed and inventoried in accordance with normal DOA procedures, which have been reviewed by USAID and found acceptable. The designated DOA procurement officer(s) will be responsible for the inspection of arrivals and the preparation of receiving reports. Reports of shortages or damages will be forwarded to the PSA, with copies to USAID, together with documentation necessary for the PSA to file insurance claims, within 30 days of arrival in country. The DOA will insure prompt and proper utilization, including adequate storage, if needed, and will prepare and submit to USAID semi-annual utilization reports, which will also reflect inventory numbers and location.

10. Procurement Schedule

It is anticipated that off-shore procurement will be effected in three major installments over the eight-year life of the project, as shown in the Implementation Plan. The schedule supposes that preliminary procurement actions can begin within a few months of project authorization. Target dates are keyed to date of approval of the project paper, of which this Commodity Procurement Plan is a part.

11. Commodity/Equipment List, by Project Component

Item	# (LOP)	Unit Price	TOTAL
a) Dollar costs			
<u>Research</u>			
Passenger vehicle	8	5,400	43,200
Utility-type vehicle	9	13,500	121,500
Motorcycles	9	500	4,500
Tractors (35-50 hp)	12	8,500	102,000
Disc harrow	10	1,640	16,400
Water pump (electric)	8	500	4,000
Sprinkler unit	2	2,000	4,000
Air conditioners	4	450	1,800
Refrigerators	10	500	5,000
Hydraulic jack	4	900	3,600
Air compressor	4	750	3,000
Chain block	4	350	1,400
Welding equipment	4	380	1,520
Sprayers	15	150	2,250
Shop tools (sets)	4	-	8,500
(Lab equipment)			
Microscope stereo 700mm	6	620	3,720
" student	3	500	1,500
" research	3	1,760	5,280
Autoclave	4	1,045	4,180
Oven	5	1,345	6,725
Incubator	5	792	3,960
Spectrophotometer, w/ accessories	3	1,056	3,168
Camera, w/ accessories	4	1,320	5,280
Solar meter	3	220	660
Transfer chamber	4	275	1,100
Flask shaker	3	1,680	5,040
Hydrothermograph	5	660	3,300
Colony counter	2	770	1,540
Balance mettler, analytical	7	5,495	38,465
Balance, comp. spring, 1kg	6	19	114
Balance, " " 10kg	6	2,625	1,575
Water bath	3	840	2,520
Refractometers, pocket	2	219	438
PH meter, w/accessories	6	833	4,998
Centrifuge	3	800	2,400
Microtome	3	453	1,359
Purity board & diaphanoscope	3	165	495
Micro computer upgrade kit (256k)	1	4,000	4,000
12 Megabyte Hard Disk	1	6,000	6,000
Terminals for Microcomputer	2	1,500	3,000
Desk calculators, etc.	-	-	4,000

<u>Technology Transfer</u>			
Utility-type vehicle	18	13,500	243,000
Motorcycles (125cc)	16	500	8,000
Teaching Aids	-	-	5,000
Audio-visual Equipment (spares)	-	-	5,000
 <u>Seed Improvement</u>			
Passenger vehicle	1	5,400	5,400
Pickup truck, 4wd, double cab	9	5,200	46,800
Motorcycles	18	500	9,000
Tractors, 60-70 hp	4	12,000	48,000
Tractors, 35-50 hp	15	8,500	127,500
Disc plow (2 furrow)	4	970	3,880
Disc plow (3 furrow)	4	1,500	6,000
Disc harrow	4	1,640	6,560
Bicycles	16	70	1,120
Rototiller	4	2,600	10,400
Sprayer, tractor mounted	4	2,650	10,600
Knapsack sprayer, power	27	315	8,505
Knapsack sprayer, hand	18	150	2,700
Water pump, electric	2	500	1,000
Water pump, diesel	7	1,500	10,500
Sprinkler unit	7	2,100	14,700
Corn planter (2 row)	2	1,980	3,960
Ridger	8	690	5,520
Tractor-mounted cultivator	4	935	3,740
Maize Thresher	2	5,390	10,780
Fumigation Unit	5	2,970	14,850
Platform scales, 100 kg.	10	1,900	19,000
Seed Testing Equipment (sets)	5	1,760	8,800
Meteorological Instruments (sets)	10	300	3,000
Processing Unit, double line (w/10% spares)	5	44,770	223,850
Packing line	5	8,690	43,450
Trolleys, Hydraulic	12	450	5,400
Vacuum cleaners	5	2,530	12,650
Air conditioners	10	450	4,500
Bag cleaners	5	3,630	18,150
 <u>Project Management Unit</u>			
Passenger vehicle	1	5,400	5,400
Utility-type vehicle	1	13,500	13,500

Dollar cost ST 1,407,702

b) Local Costs

Research			
Trailer	8	1,000	8,000
Technology Transfer			
Production materials		5,000	5,000
Seed Improvement			
Tipping Trailer	6	1,600	9,600
Pallets	5,500	17.60	96,800
Project Management Unit			
Electric typewriter	1	1,320	1,320
Photocopy machine	1	3,400	3,400
Misc. Office Equipment	-	-	5,000

		Local cost ST	129,120
		Grand total	1,536,822

12. Distribution of Commodities

The majority of commodities and equipment to be financed by the project are for seven regional research centers, five seed processing facilities, and four seed production farms. Proposed distribution of commodities and equipment is shown on the following tables.

Table 1
COMMODITIES DISTRIBUTION: REGIONAL RESEARCH CENTERS

1. Commodities/Equipment (Large items)	MI *	KIL	APL	BAND	KA	MAK	GIR	PER	TOTAL
Tractors (4-wheel)	2	2	2	-	2	2	2	-	12
Trailers (2-wh for 4-wh tractor)	2	2	-	-	2	2	-	-	8
Disc harrow	2	2	2	-	2	2	-	-	10
Water pump (2" & 4" diesel)	4	-	-	-	-	4	-	-	4
Sprinkler Unit	-	-	-	-	2	-	-	-	2
Air conditioner	-	-	2	-	-	2	-	-	4
Refrigerator	2	1	1	2	2	2	-	-	10
Hydraulic jack	-	1	1	-	1	1	-	-	4
Air compressor	-	1	1	-	1	1	-	-	4
Chain block	-	1	1	-	1	1	-	-	4
<hr/>									
2. Commodities/Equipment (Small items)									
Water bath, with 1 kw. heater (230v)	1	-	-	-	1	1	-	-	3
Refractometers, Pocket	1	-	-	-	-	1	-	-	2
PH meter direct reading large scale for general purpose	1	1	1	1	1	1	-	-	6
Centrifuge	-	1	-	-	1	1	-	-	3
Microtome (table model)	-	1	-	-	1	1	-	-	3
Purity board & Diaphanoscope	1	-	-	-	-	1	1	-	3
									Con't

* Legend: MI - Maha lluppallama MAK - Makandura
 KIL - Kilinochchi GIR - Girandurukotte
 APL - Angunakolapelessa PER - Peradeniya
 ANP - Bandarawela
 KA - Karadiyan Aru

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2. Small items , Con't:

	MI	KIL	APL	BAND	KA	MAK	GIR	TOTAL
Microscope, stereo - zoom	1	1	1	1	1	1	-	6
Microscope, Student advanced with magnifications x 40 x 100 x 400	1	-	-	-	1	1	-	3
Microscope, Research with high quality optics and illuminator	1	-	-	-	1	1	-	3
Autoclave	1	-	-	1	1	1	-	4
Oven max. 250c (230 V)	1	1	-	1	1	1	-	5
Incubator temp range 5C - 100C (230 V)	1	1	-	1	1	1	-	5
Spectrophotometer, student use	1	-	-	-	1	1	-	3
Camera with accessories and attachments for field and laboratory use	1	1	1	-	-	1	-	4
Solar meter/integrated system battery operated with AC adapter (portable)	1	1	-	-	-	1	-	3
Transfer chamber for pathological work	1	-	-	1	1	1	-	4
Flask shaker	1	-	-	-	1	1	-	3
Hydrothermograph 0 ⁰ -50 ⁰	1	1	1	-	1	1	-	5
Colony counter with sensitivity needle probe and illumination lamp	1	-	-	-	-	1	-	2
Balance mettler analytical, capacity 161 gm. precision + 0.05 mg.	1	1	1	1	1	1	1	7
Balance, compression spring capacity 1 kg., with single top pan	1	-	1	1	1	1	1	6
Balance compression spring capacity 10 kg., with single top pan	1	-	1	1	1	1	1	6

Table 2

COMMODITIES DISTRIBUTION: SEED PROCESSING EQUIPMENT

Commodities/Equipment	PEL*	ALUTH	BA	NIK	P/K	TOTAL
Processing Unit (double line)	1	1	1	1	1	5
Maize threshers	1	1	-	-	-	2
Platform scales, type 250kg	2	2	2	2	2	10
Packaging lines	1	1	1	1	1	5
Ballets	1500	1500	1500	500	500	5500
Froleys (hydraulic)	4	2	2	2	2	12
Vacuum cleaners	2	2	1	1	2	8
Air conditioners	2	2	2	2	2	10
Bag cleaners	1	1	1	1	1	5
Seed testing equipment (Seed moisture testers, purity analysis, germinator w/temperature control	1	1	1	1	1	5
Fumigation units	1	1	1	1	1	5

Table 3

COMMODITIES DISTRIBUTION: SEED FARM EQUIPMENT

Commodities/Equipment	PEL*	ALUTH	BA	NIK	P/K	TOTAL
Tractors 60-70 hp	2	1	1	-	-	4
Tractors 35-45 hp	6	3	3	1	2	15
Disc plough (2 furrows)	1	1	1	-	1	4
Disc plough (3 furrows)	1	1	1	-	1	4
Disc harrow	1	1	1	-	1	4
Tipping trailers	1	2	1	1	1	6
Rotatiller	1	1	1	-	1	4
Tractor-mounted sprayers	1	1	1	-	1	4
Knapsack power sprayer	10	5	5	5	2	27
Knapsack hand-operated sprayer	5	2	5	4	2	18
Water pump, electric	-	-	-	-	2	2
Water pump, diesel	2	2	2	-	1	7
Sprinkler unit	2	2	2	-	1	7
Corn planter (2 rows)	1	1	-	-	-	2
Ridgers	3	2	2	-	1	8
Cultivators, tractor-mounted	1	1	1	-	1	4
Weather monitoring equipment	2	2	2	1	3	10

* Legend: PEL - Pelwehera Processing Facility and Farm

ALUTH - Aluththarama Processing Facility and Farm

BA - Bata Ata Processing Facility and Farm

NIK - Nikaweratiya Processing Facility

P/K - Paranthan Processing Facility and Killinochchi Farm

TABLE 4
VEHICLE ALLOCATION (PROPOSED)

	MI	MIL	APL	BAND	KA	MAK	PER	PED	ALU	BAT	NIN	PAR/KIL	OTHER *
A. RESEARCH													
1. Research Division													
a. Passenger Vehicle													
- National Crop Coordinator (4)	3		1										
- For ST & LT TA (3)								3					
b. Jeeps (6)	1	1	1		1	1	1						
c. Motorcycles (5) (For RRC)	1	1	1	1	1								
2. Economics & Proj.Div.													
a. Passenger Vehicle (1) (For LT TA)													
								1					
b. Jeeps (3)				1		1	1						
c. Motorcycles (4)	1	1	1	1									
E. Seeds													
1. Passenger Vehicle (1) (For TA)													
								1					
2. 4 W.D. double cab pick-ups													
- Regional ADD (5)									1	1	1	1	
- Farms (4)									1	1		1	
3. Motorcycles (18) (For AI & KVS)													
								4	4	3	4	3	
C. Technology Transfer													
1. Jeeps													
- Regional broad-casting units (3) (Ruhuna, Anuradhapura, Kandy)								1					2
- Extension field staff (15)													15
2. Motorcycles													
- For SMC & AI (15)													15
- for broad-cast unit support coordinator (1)													1
D. Project Management Unit													
- Passenger Vehicle (1)													
								1					
- for technical workplan								1					

* Sites to be confirmed/determined based upon technical workplan.

Best Available Document

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Other Donor Assistance Related to the SFC

Current projects associated with SFC in the intermediate and dry zones of Sri Lanka are briefly described below. (All are in association with the DOA unless otherwise noted).

Project Title	Duration	Sponsor	Funding('000)	Description
Dry Zone Agriculture	A new five year project is now being developed for 1985-1989.	CIDA	Can.\$2,000	Intensify & stabilize rainfed agriculture in the dry zone by means of adaptive research.
Agricultural Extension and Adaptive Research	1979-1985	World Bank	US\$9,700	Improvement of basic capability for adaptive research, training & extension.
Seed Certification Service	1978-1987	Netherlands	US\$2,100	Establish a seed certification program with supporting laboratories.
Vegetable Seed Project	1983-1985	Netherlands	US\$525	Strengthen and develop a vegetable seed production program.

Seed Potato Project	1981-1985	Netherlands	US\$825	Strengthen infrastructure for seed potato management & handling.
Fertilizer Trials		FAO		Demonstrate importance of fertilizer use to increased crop production.
Muthukan-Dry land Project	1978-1984	ADAB/Australia		Development of dryland farming on a watershed management system.
Breeding Improved Varieties of Grain Legumes & Sorghum	1981-1984	IDRC	Can.\$168	Expand and strengthen existing breeding programs at Mahallupallama.
Cropping Systems	1982-1985	IDRC	Can.\$272	Develop component technology for cropping patterns at representative sites.

Oilseed Improve- ment	1980- 1983	IDRC	Can.\$202	Develop settled, productive, oilseed- based farming systems, specific- at Anguna- kolapelessa RRC.
Anura- dhapura Dry Zone Project	1981- 1985	ADB/ IFAD, with MADR	US\$39,600	Resettle- ment of about 23,000 farm families presently engaged in shifting cultiva- tion. Work includes infrastruc- ture devel- opment such as tank rennovation but little research support.

Regional Analysis of the Performance of New Technologies in Rice-Based Farming Systems	1984-1986	Australian Center Int'l Ag'l Research (ACIAR), through the Australian National University	Aus.\$92	To focus on the determinants of gaps between research station yields and farmers' yields of rice.
Village Irrigation Rehabilitation	1981-1985	ADA, with Irrigation Dept. (Min. of Lands)	US\$30,000 Credit	Rehabilitation of irrigation tanks, and implementation of Maha rice plus Yala irrigated dryland-cropping pattern.
Study on Upland Farming	1982-1984	ODA (through Cambridge University), with ARTI	US\$18	Provide data and models to describe & analyze a range of characteristic upland farming situations.

Of the above, the most important or relevant to this project are the World Bank-funded AEARP, the Netherlands-funded Seed Certification Service, the Phase II of the CIDA-funded Dry Zone Agriculture Research Project, the Muthukandiya Dryland Project, the work on rice-based cropping systems, the Village Irrigation Rehabilitation Project, and the two study projects on rice-based and upland farming systems. Contacts with these projects are well-established, and will be maintained throughout the life of project to ensure complementarity of efforts.