

# A.I.D. EVALUATION SUMMARY

(BEFORE FILLING OUT THIS FORM, READ THE ATTACHED INSTRUCTIONS)

NO. A7AX-302  
15P-54687  
PART I  
NO. A7AX-302-A

**A. REPORTING A.I.D. UNIT:**

USAID/Sri Lanka

(Mission or AID/W Office)

(EE# 87/7 )

**B. WAS EVALUATION SCHEDULED IN CURRENT FY ANNUAL EVALUATION PLAN?**

yes  slipped  ad hoc

Eval. Plan Submission Date: FY    Q   

**C. EVALUATION TIMING**

Interim  final  ex post  other

**D. ACTIVITY OR ACTIVITIES EVALUATED** (List the following information for project(s) or program(s) evaluated; If not applicable, list title and date of the evaluation report)

Project #	Project/Program Title (or title & date of evaluation report)	First PROAG or equivalent (FY)	Most recent FACD (mo./yr)	Planned LOP Cost ('000)	Amount Obligated to Date ('000)
383-0058	Diversified Agriculture Research	1984	8/92	11,400	11,400

**E. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR**

Action(s) Required

Name of officer responsible for Action

Date Action to be Completed

1. Approve all Participant study programs by all parties concerned and appoint a PGIA supervisor prior to any participant's departure from Sri Lanka for overseas studies.

DOA, PGIA

Immediately

2. Appoint a part-time coordinator assigned and reporting directly to the Director of Agriculture for all split training programs with the Post Graduate Institute of Agriculture (PGIA).

DOA

January 31, 1988

3. Authorize adequate budget allocations for in-country training costs of long term participant trainees.

DOA

GSL FY 1988

4. Authorize an increase in the participant training in-country research allowance from \$1080 to \$1200/student/year.

DOA, USAID

December 31, 1987

5. Explore the possibility of joint degree programs with U.S. Universities.

DAI, IIE

Immediately

(Attach extra sheet if necessary)

F. DATE OF MISSION OR AID/W OFFICE REVIEW OF EVALUATION: mo 11 day 23 yr 87

**G. APPROVALS OF EVALUATION SUMMARY AND ACTION DECISIONS:**

Project/Program Office:  
Signature: *[Signature]*  
Typed Name: Charles Strickland

Representative of Borrower/Grantee:  
Irwin Gunawardena  
DOA Director

Evaluator:  
Office: *[Signature]*  
Richard McLaughlin

Mission AID/W Office Director:  
*[Signature]*  
Peter J. Bloom

Date: 11/4/88

Date: 11/11/87

Date: 12/31/87

Date: 1/17/88

Cont: E

- |   |                           |                   |
|---|---------------------------|-------------------|
| 6. Provide commodity support to PGIA for the implementation of in-country degree training activities.   | DOA USAID                 | December 31, 1987 |
| 7. Enroll the two ongoing Ph.D participants and the remaining three Ph.D participants in full U.S. degree programs, with research carried out in Sri Lanka.   | DOA, PGIA<br>DAI, USAID   | January 31, 1988  |
| 8. Increase DAI contract technical assistance by 70 PH (54 PH long term and 16PH short term).   | MF&P, MADR,<br>DOA, USAID | March 31, 1988    |
| 9. Develop a strategy and plan to carry out research to emphasize minimizing the production costs of SFC's.   | DOA, DAI                  | GSL FY 1988       |
| 10. Establish a "Special Project Fund" in the DOA budget, funded by the DARP grant, to support innovative projects.   | DOA, MADR<br>USAID        | January 31, 1988  |
| 11. Establish a small discretionary fund for urgent incidental operational expenses for the DAI contract team.  | DOA, MADR<br>USAID        | January 31, 1988  |
| 12. Plan and implement a series of management workshops covering topics such as management information systems and program planning and budgeting.  | DAI, DOA                  | GSL FY 1988, 1989 |
| 13. Provide a short term management information specialist for a review of technical and administrative information flows and to design and assist in implementation of an improved information system. | DAI, DOA                  | GSL FY 1988       |
| 14. Design and implement middle and upper management in-country training programs.  | DAI, DOA                  | GSL FY 1988, 1989 |

## H. EVALUATION ABSTRACT (Do not exceed the space provided)

This is an institution building project to strengthen the research division, extension division, seed division and overall management of the Department of Agriculture to generate and effectively transfer technologies and seed required to increase and sustain production of subsidiary field crops (SFC) on small farms. The project is being implemented by the Department of Agriculture with technical assistance and training provided under a USAID direct contract with Development Alternatives, Incorporated. This first interim evaluation completed at the two year mark of this eight year project was conducted by an outside evaluation team who based their conclusions and recommendations on project documentation, interviews with all key personnel as well as field trips to two major Regional Research Centers, three seed processing and production installations, one field extension office and parts of the Mahaweli Irrigation System. The purpose of the evaluation was to review progress in early implementation, identify problems and make suggestions for their solution, and suggest any mid-course corrections required. The major findings and conclusions are:

- Overall implementation is good and no major design or component changes are recommended.
- The initial assumption of unlimited demand for increased SFC production is not valid. The project must adjust by researching market problems.
- Good progress has been made in developing a successful commodity research program in SFC. The Farming System Research and Extension (FSR/E) component however has progressed slower than was expected. The socio-economic studies completed have been well conceived and have been used to adjust workplans.
- The Extension program has been hampered by an inadequate core budget and the project resources for mass media delivery have not yet been exploited.
- Seed component progress has been quite satisfactory and growing support for privatization of the seed industry is due in large part to DAKP activities.
- The short-term training program has gone well and is meeting D.O.A. training needs.
- The rationale for the long-term training "split degree" program is sound but adequate preparation was often not done prior to departure of the initial participants and inadequate provision for allowances and research arrangements upon their return caused frustration. The problems can be solved but require prompt attention.
- Overall management and coordination of the D.O.A., SFC program has been strengthened by the process of developing the Life of Project (LOP) workplan and the annual updates. Additional study of the flow of technical and administration information is required as well as middle management training.
- The key lesson noted by the evaluators was that "haste often makes waste". With a complex project such as this with many innovative components such as the split training program and primary implementation responsibility resting on the D.O.A., the project should learn to live with delays rather than try to push things too fast.

## I. EVALUATION COSTS

1. Evaluation Team Name	Affiliation	Contract Number CB TDY Person-Days	Contract Cost CB TDY Cost (US\$)	Source of Funds
Dr. John Robins	CID	27	\$21,732	Project
Mr. Charles Uphaus	AID/W/ANE/TR	23	\$ 4,888	USAID/Sri Lanka

2. Mission/Office Professional Staff Person-Days (estimate) 40

3. Borrower/Grantee Professional Staff Person-Days (estimate) 75

## A.I.D. EVALUATION SUMMARY PART II

## J. SUMMARY OF EVALUATION FINDINGS, CONCLUSIONS AND RECOMMENDATIONS (Try not to exceed the 3 pages provided)

Address the following items:

- Purpose of activity(ies) evaluated
- Purpose of evaluation and Methodology used
- Findings and conclusions (relate to question(s))
- Principal recommendations
- Lessons learned

Mission or Office: USAID/Sri LankaDate this summary prepared: November 6, 1987Title and Date of Full Evaluation Report: First Interim Evaluation Diversified Agriculture Research, Sri Lanka Project No. 383-0058

1. The Government of Sri Lanka (GSL), in 1984, produced a National Food, Agriculture, and Nutrition Strategy which identified strategic approaches to national priorities in this sector. A main thrust of the strategy dealt with diversification of crop production as a response to approaching self-sufficiency in rice. Supporting services of research, extension, training and seed production were needed for the SFC. The goal of the Diversified Agriculture Research Project (DARP) is to "increase small farmer income and employment in the dry and intermediate zones, and to improve nutrition." The purpose is "to strengthen the institutional capability to generate and effectively transfer technologies and seed required to increase and sustain SFC production by small farmers."
2. The purpose of this interim evaluation is to review progress in early implementation, to identify problems and make suggestions for their solution, and to suggest any mid-course corrections that might improve the ultimate value or impact of the project.
3. The evaluation was conducted by an outside consultant, John Robins, provided under an Indefinite Quantity Contract (IQC) with the Consortium for International Development, who served as team leader, and Charles Uphaus, AID Agricultural Officer in the Asia/Near East Bureau in Washington D.C. The team based its conclusions and recommendations on project documentation, visits with all key personnel associated with the project at the Ministry of Agricultural Development and Research (MADR), USAID, the Department of Agriculture (DOA) and Development Alternatives, Incorporated (DAI) team headquarters in Peradeniya, as well as field trips to two of the major Regional Research Centers, three seed processing and production installations and to one field extension office. The team was also able to observe parts of the Manaveli Irrigation System.
4. Findings and conclusions
  - A. Key assumptions underlying this project that have not been fully realized and that pose a threat to project success are: 1) Presence of adequate extension and in-service training capability; 2) A GSL commitment to expand markets for SFCs; and 3) A Department of Agriculture (DOA) capability to organize and implement an integrated diversification program. It is too early to judge whether and, if so, when these assumptions may be fulfilled, but GSL and USAID management must take effective steps to see that they are addressed.

- B. Recent economic analyses suggest less scope for increasing SFC production than was earlier believed. The increased technical capacity of the DOA resulting from achieving the project purpose may, therefore, end up being used in programs other than support for the SFC. Even so, it will be a good investment and will have lasting positive impact.
- C. Progress has been made in developing a successful commodity research program in SFC. Farming Systems Research & Extension (FSR/E) is the one component that seems to be floundering. Greater socio-economic input is needed, in the FSR/E, in the underlying commodity research, and in marketing. Good progress has been made in the socio-economic studies. The baseline survey, although running somewhat behind schedule, is proving a valuable tool in upgrading survey and statistical capability of the Division of Agricultural Economics and Projects (DAEP), and will be of value in monitoring and evaluating progress of the project toward its goal.

In contrast, the development of a viable extension program has been hampered by inadequate resources, and the opportunity in mass media delivery has not been exploited. There is consensus that a reasonable stock of useful technology is currently available. Resources and the initiative for effective transfer of these and any new technologies are needed.

It is difficult, under current DOA budgeting procedures, to determine to what extent the DOA may be shifting increased resources to the SFC, but recurrent cost budgets and supporting personnel (technical and administrative) still appear inadequate. The recent tabling of a DOA life-of-project (LOP) work plan, even though delayed and exhibiting some weaknesses, suggests a developing ownership of a longer-term SFC research commitment.

- D. Linkages among the several DOA divisions, universities, farmers, international and other national research/seed centers seem to be developing satisfactorily, although information flows are sometimes inadequate. There is a need for a variety of training exercises in management to upgrade skills, especially at the middle management level.
- E. Progress in the seeds component has been quite satisfactory. There seems to be growing support for privatization, due in part to DARP activities (the seeds workshop and the feasibility study). This suggests a need to re-evaluate construction and commodity inputs for this component.
- F. The short-term training program has gone well. It is meeting needs of DOA personnel dealing with the SFC. The degree training program, however, is in trouble. Objections to the decision to exclusively use the split-training model (non-degree academic program at a U.S. or third country university, research in-country, and the degree granted by the University of Peradeniya through its Post Graduate

Institute of Agriculture) threatens success in this, potentially the most important and lasting component of the project. The problem is bad, and will get worse unless immediate and effective remedial action is taken. The split-training option remains a sound approach with lasting benefits to the country. But, if it is to have continuing utility, the problems in its implementation must be resolved.

- G. The time frame for planning of construction and the procurement of commodities, as indicated in the PP, was wildly over-optimistic. Delays in construction planning will most likely not prove a serious constraint. However, delays in contracting a Procurement Services Agent (PSA) and other snags in procurement have already hampered implementation, both in terms of effectiveness of technical assistance and progress in certain other components such as the baseline survey. As a result of delays, it now appears that the project's commodity procurement budget may be in excess of what will be used.
- H. The technical assistance (TA) contractor, Development Alternatives, Inc. (DAI), has performed generally very well. The long- and short-term personnel provided have been well chosen, were delivered on a timely basis, and were effective in their work. The Institute for International Education (IIE) has managed the training satisfactorily.

#### 5. Recommendations

- A. The project should continue. No major design or component changes are recommended at this time.
- B. DOA and MADR management should give concerted attention to fulfillment of assumptions noted in 4.A above.
- C. Significant additional TA, both long- and short-term, is needed. Priorities for long-term are the Chief of Party (COP), the agronomist, a legume breeder and, depending on GSL action, the seed specialist.
- D. A full-time DOA coordinator for all split training with the PGIA should be appointed by the Director of Agriculture, and assigned to report directly to him. Agreement by all concerned parties on study programs and supervisors prior to scholars' departure from Sri Lanka for overseas study, and adequate supervision and support when he/she returns are essential. Candidates for PhDs should be exempted from the requirement of split programs, and exemptions provided for Masters candidates where necessary resources are not available in Sri Lanka.
- E. The DOA must enhance operational funding and support staff, especially in research and economics, if the project goal and the strategy of the GSL for agricultural diversification are to be fulfilled.
- F. The commodity procurement procedures should be modified to permit direct, local off-the-shelf acquisition wherever possible. The PSA should deal only with major equipment and those smaller items not available locally.

- G. Seeds construction and commodity procurement should be restructured so that these act to support specifically the Seeds Division's capabilities in breeder and foundation seed production, processing and maintenance, and so that the equipment provided has utility in the private sector.
- H. USAID and the DDA should establish a "special project fund" in the DDA budget, with grant funding from DAKP, to support innovative projects and awards on a competitive basis.

6. Lessons Learned

Several "firsts" were encountered in this project: It is the first project of such complexity taken on by the DDA; it is the first project to extensively use split training as the primary training mode; it is the first time that the DDA has used a PSA or an A&E firm to undertake procurement and facilities design and supervision on its behalf. Further, it is one of the first projects wherein the DDA, rather than a contractor, has had primary implementing responsibility. Not surprisingly, projected schedules were far too optimistic to accommodate the necessary learning experience. Resources to assure that problems were dealt with were often inadequately organized.

The lesson here is that, in implementing development assistance projects, "haste often makes waste". Projects with the above characteristics should anticipate, and learn to live with, agonizing delays--it is generally better to accommodate to them than to try to push things too fast.

K. ATTACHMENTS (List attachments submitted with this Evaluation Summary; always attach copy of full evaluation report, even if one was submitted earlier)

PAGE 6

A. First Interim Evaluation, Diversified Agriculture Research, Sri Lanka  
Project No. 383-0058.

L. COMMENTS BY MISSION, AID/W OFFICE AND BORROWER/GRANTEE

This evaluation was comprehensive, unbiased, and represents a clear and impartial view of project progress to date. The Mission has endorsed all major recommendations which have been listed in Part One of the AID evaluation summary in order of Mission priority and reworded in a concise, action oriented fashion. Together with the Government of Sri Lanka, the Mission intends to address all of the Part One recommendations by mutual agreement through countersigned Project Implementation letters.

8

*KD-AXX-302A*

*non-54683*

FIRST INTERIM EVALUATION  
DIVERSIFIED AGRICULTURAL RESEARCH

SRI LANKA

Project No. 838-0058

Prepared for:

United States Agency for International Development  
Colombo, Sri Lanka

by

John Robins  
and  
Charles Uphaus

October 9, 1987

This report presents the independent findings, conclusions and recommendations of an evaluation team. It does not necessarily represent the official views of the Government of Sri Lanka or the Agency for International Development.

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BASIC PROJECT IDENTIFICATION DATA

1. Country : Sri Lanka
2. Project Title : Diversified Agricultural Research
3. Project Number : 383-0058  
Loan Number : 383-T-033
4. Project Dates : August, 1984 - August, 1992
  - a. First Project Agreement : 8/24/84
  - b. Final Obligation : FY88 (Planned)
  - c. Project Assistance Completion Date (PACD): 08/31/1992
5. Project Funding:
  - a. A.I.D. Bilateral Funding (Grant and/or Loan): US\$11.4 Million
  - b. Other Major Donors : None
  - c. Host Country Counterpart Funds: US\$5.16 Million rupee equivalent
6. Mode of Implementation: AID direct contract with Development Alternatives, Inc. (DAI). AID Grant and Loan to Government of Sri Lanka (GSL) to be used along with GSL funds to finance participation of Department of Agriculture in the program.
7. Project Design : The Government of Sri Lanka, USAID/Colombo, International Agricultural Development Service (IADS), and International Science and Technology Institute (ISTI)
8. Responsible Mission Officials:
  - a. Mission Director: Frank Correl 1984 - 1986  
Robert Chase 1986 - 1987  
Peter Bloom 1987
  - b. Project Officer: C. Uphaus 1984 - 1985  
C. Strickland 1985 - present
9. Previous Evaluation: None
10. Cost of present evaluation:
  - a. ANE/TR/ARD Agricultural Economist  
Charles Uphaus (USAID/Colombo funds)
  - b. Contract with Consortium for  
International Development  
(IQC)---US\$25,000.

## EXECUTIVE SUMMARY

1. This evaluation was initiated by USAID/Colombo. The full evaluation report is titled "First Interim Evaluation, Diversified Agricultural Research, Sri Lanka Project No. 383-0058" and is dated October, 1987.
2. The Government of Sri Lanka (GSL), in 1984, produced a National Food, Agriculture, and Nutrition Strategy which identified strategic approaches to national priorities in this sector. A main thrust of the strategy dealt with diversification of crop production as a response to approaching self-sufficiency in rice. Supporting services of research, extension, training and seed production were needed for the SFC. The goal of the Diversified Agriculture Research Project (DARP) is to "increase small farmer income and employment in the dry and intermediate zones, and to improve nutrition." The purpose is "to strengthen the institutional capability to generate and effectively transfer technologies and seed required to increase and sustain SFC production by small farmers."
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- D. Linkages among the several DOA divisions, universities, farmers, international and other national research/seed centers seem to be developing satisfactorily, although information flows are sometimes inadequate. There is a need for a variety of training exercises in management to upgrade skills, especially at the middle management level.
- E. Progress in the seeds component has been quite satisfactory. There seems to be growing support for privatization, due in part to DARP activities (the seeds workshop and the feasibility study). This suggests a need to re-evaluate construction and commodity inputs for this component.
- F. The short-term training program has gone well. It is meeting needs of DOA personnel dealing with the SFC. The degree training program, however, is in trouble. Objections to the decision to exclusively use the split-training model (non-degree academic program at a U.S. or third country university, research in-country, and the degree granted by the University of Peradeniya through its Post Graduate Institute of Agriculture) threatens success in this, potentially the most important and lasting component of the project. The problem is bad, and will get worse unless immediate and effective remedial action is taken. The split-training option remains a sound approach with lasting benefits to the country. But, if it is to have continuing utility, the problems in its implementation must be resolved.
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- G. Seeds construction and commodity procurement should be restructured so that these act to support specifically the Seeds Division's capabilities in breeder and foundation seed production, processing and maintenance, and so that the equipment provided has utility in the private sector.
- H. USAID and the DOA should establish a "special project fund" in the DOA budget, with grant funding from DARP, to support innovative projects and awards on a competitive basis.

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## ACRONYMS

AAPC	Afro-American Purchasing Center
AEARP	Agricultural Extension & Adaptive Research Project
ARP	Agricultural Research Project
COC	Cost of Cultivation
COP	Chief of Party
CRSP	Collaborative Research Support Project
CTB	Cabinet Tender Board
DA	Director of Agriculture
DAEP	Division of Agricultural Economics & Projects
DAI	Development Alternatives Incorporated
DARP	Development Agricultural Research Project
DD	Deputy Director
DOA	Department of Agriculture
ED	Extension Division
ETD	Education & Training Division
FA	Faculty of Agriculture
FSR/E	Farming System Research & Extension
GSL	Government of Sri Lanka
IQC	Indefinite Quantity Contract
LOP	Life of Project
MADR	Ministry of Agricultural Development & Research
MARD	Mahaweli Agriculture and Rural Development (Project)
PACD	Project Assistance Completion Date
PCC	Project Coordination Committee
PGIA	Postgraduate Institute for Agriculture
PM	Project Manager
PMC	Project Management Committee
PMU	Project Management Unit
PP	Project Paper
PSA	Procurement Services Agent
PSC	Personal Services Contract
RAE	Regional Agricultural Economist
RDC	Resources Development Associates
RRC	Regional Research Center
RD	Research Division
SCS	Seed Certification Service
SFC	Subsidiary Field Crops
SD	Seeds Division
TA	Technical Assistance
UP	University of Peradeniya
USAID	U.S. Agency for International Development

## EVALUATION REPORT

### I. INTRODUCTION

Over the past several years Sri Lanka has significantly increased its production of rice, the staple food grain in the diets of Sri Lankans. At the same time, the Government has accelerated the development of the Mahaweli Project. New lands and improved water supplies to existing irrigated lands will be available for irrigated crop production. Settlers on new lands will generally have some rainfed cropland also. Thus, like several other Asian countries, Sri Lanka is approaching a situation of self-sufficiency and a prospect of surplus production in rice, with little scope for export and probably little demand for production for other than direct domestic human consumption. In order to effectively and efficiently utilise land, water and human resources there must now be a search for alternatives that incorporate other crops into the production system.

As rice self-sufficiency is approached, there is at the same time a deficit in other agricultural commodities including coarse grains, grain legumes, oil crops, and poultry and livestock products. Faced with this situation, the Government of Sri Lanka (GSL) has moved to a conscious policy of promotion of the so-called subsidiary field crops (SFC) under both rainfed and irrigated conditions. It was against that background that this project was conceptualised.

Although most of the SFC, including vegetable and root crops, have long been cultivated in Sri Lanka, the expanded production of these crops and the diversification of the production system faces serious technological and institutional constraints. Past emphasis in the research, extension, training and seed programs for field crops has been limited largely to paddy. Of course, research on other specialised commodities such as sugar, tea, rubber, coconut, and other export crops has been substantial, but the level of effort on the SFC has been negligible until the very recent past. With the advent of promotion of these commodities and a strategy entailing application of research, extension, training and seed production to support their production, the regional research centers (RRC) have moved rather strongly to increase attention to the SFC. The DARP lent additional impetus to this shift of attention at the several RRCs, in the extension effort in areas where production of these commodities is important, and in the seeds program of the DOA.

Allied with the past neglect of production research, extension and seed production to support SFC production is the lack of attention to the orderly marketing of these commodities. While there is an economic rationale for producing these commodities for local and export markets, the production and utilization systems seem to be in disharmony. Traders appear interested in buying, and farmers in producing and selling, such commodities as maize and soybeans, but the two rarely seem to connect. (This is probably less true for certain other commodities where some stability in the market does seem to exist-- crops such as onions, chillies, the grams, and potatoes.) So, along with the need for production support, there appears to be a need for attention to the marketing dimension of the agricultural system for these commodities.

The project is designed to address most of the constraints suggested above. It is now substantially two years into implementation. This evaluation is to assess progress to date, and to recommend any mid-course corrections or remedial actions that might be needed to enhance productivity of the project and its ability to develop the institutional capacity to provide continued support to the SFC production and marketing system after the project is completed.

## II. EVALUATION METHODOLOGY

This is the first interim evaluation of the Diversified Agricultural Research Project (DARP). The primary objective of the evaluation is to review implementation progress and to recommend changes if appropriate. As a secondary objective the evaluation is also to assess progress relative to the project's purpose and goals. The evaluation was conducted by an outside consultant, John Robins, provided under an Indefinite Quantity Contract (IQC) with the Consortium for International Development, who served as Team Leader, and Charles Uphaus, AID Agricultural Officer in the Asia/Near East Bureau in Washington, D.C.

The findings and conclusions upon which recommendations in this report are based were generated primarily from existing documents and from personal interviews with a large number of people associated with the project. This included all of the basic documentation for the project and the several monthly, quarterly, and annual reports and special reports by the DAI team and other participants in implementation of the project. Also included were a number of special summaries requested of the USAID staff and the contractor team relative to the financial, construction, procurement and training facets of the project.

The team was able to visit not only the Ministry of Agricultural Development and Research (MADR) and USAID headquarters in Colombo, and the Department of Agriculture (DOA) and Development Alternatives, Incorporated (DAI) team headquarters in Peredeniya, but travelled to two of the major RRCs and three seed processing and production installations, and to one field extension office. The team was also able to observe parts of the Mahaweli irrigation system, which is a major factor in terms of capacity for production of agricultural commodities including the SFC.

The key documents studied and the personnel with whom the team interacted are listed in the appendices. The team discussed their findings, conclusions and recommendations with USAID, GSI and DAI personnel, and left behind a final report on departure from country. The evaluation was conducted during the period September 10 to October 9, 1987.

## III. PROJECT FRAMEWORK

### A. Project Goal and Purpose

The project's logical framework matrix is included as Appendix I. In summary, the goal is to increase small farmer income and employment in the dry and intermediate zones of Sri Lanka, and to improve nutrition, particularly of the rural people, in those areas. Indicators of goal achievement include increased production-- per acre and aggregate -- of

the SFC; increasing returns to labor in SFC production; increased incomes of dry and intermediate zone farmers; and increased availability of target crops at affordable prices.

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

The end of project status would hopefully see improved SFC varieties and production practices identified and disseminated to farmers; research strategies and priorities being set on the basis of farmer and market needs; upgraded SFC seed processing and marketing systems meeting a significant share of the annual SFC seed requirements, with a growing private sector role in certified and registered seed production and marketing; increased understanding of SFC cropping patterns and of social and economic factors affecting production reflected in DOA decision-making; and an integrated, interdivisional management system for SFC-related activities in operation.

Although a somewhat ambitious undertaking (by all accounts the most complicated project undertaken to date by the Department of Agriculture), the evaluation team believes that the goal and purpose are within reach given the resources and time constraints entailed in the project.

#### B. Project Inputs and Anticipated Outputs

Financial inputs to the project are provided through grant and loan funds from AID in a total amount of 11.4 million US dollars, and a GSL contribution, both cash and in-kind, of approximately 5,160,000 U.S. dollars. The total support provides substantial technical assistance, training, commodities, facilities construction and improvement, personnel, operations and maintenance costs associated with SFC programs of the DOA, social and economic research, cost sharing with centrally funded AID projects for specific inputs, and funds for evaluation. The anticipated outputs and other relevant design data are shown in the logical framework matrix.

AID funds will assist in financing the four principle project components: strengthening the SFC research capability; improving extension; improved seed production and distribution; and strengthened project-specific and overall DOA management capability. The project will provide assistance to seven RRCs; to extension programs and In-Service Training Institutes in the project area; to four Seed Processing Centers and three seed farms; and to DOA headquarters in Peradeniya.

Development of human capital is perhaps the most important and lasting output of the project, and participant training (both long-term and short-term) is a major input. Major responsibility in oversight and execution of the academic training program under DARP falls jointly to the Post Graduate Institute of Agriculture (PGIA) at the University of Peradeniya and to the DOA.

Although it is very early in the life of the project, the team acknowledges movement towards achievement of the project outputs and purpose as proposed. At this stage, one cannot with any great certainty postulate achievement of the quantitative outputs described in the logical framework, but in general the team is impressed with the movement seen. Substantial progress has been made in several of the outputs areas, and one would have to conclude that the progress in most equals or exceeds what might had been expected at this stage.

### C. Design Assumptions

Sober assessment of the current situation leads one to the conclusion that several of the key assumptions (both those presented in the logical framework matrix and in the PP narrative) have not yet been met. Several of these relate to budgets, and the timing and quality of inputs. While posing problems for implementation, these do not undermine the basic rationale for the project.

A second type of assumption, presented in the Logframe as necessary for achieving outputs, has to do with other donor activity--specifically the IBRD-funded Agricultural Extension and Adaptive Research Project (AEARP) for assuring the extension link for DARP, and the Netherlands-funded Seed Certification Service (SCS), which is essential to the development of a Sri Lankan seed industry. The SCS project did succeed in establishing a viable seed certification service. The AEARP, however, while realizing significant accomplishments, has not resulted in the development of an extension program (incorporating both the Extension, and the Education and Training Divisions of the DOA) adequate to the burden being placed upon it.

A large extension cadre has been fielded and an in-service training program established, but with limited and decreasing (in real terms) operational budgets which limit effective and innovative work. Further, the AEARP did very little to develop the mass media potential for extension in a country with high literacy, and universal radio and widespread television coverage. As a result, "technology transfer" under DARP is not up to expectation: additional inputs to address this deficiency may be warranted.

A third set of assumptions has to do with the commitment of the GSL to agricultural diversification and the maintenance of its priorities on SFC expansion. In fact, this commitment has not moved much beyond the verbal stage, with no evidence of any concerted GSL action to expand markets for SFC's, only limited increase in resources for SFC-related research and extension, and up to now, less than full response to the personnel needs identified in the PP.

Related to the question of GSL commitment is the assumption for achieving goal targets (improved farmer income and employment) of "positive economics of SFC production". The PP's Economic Analysis stated as one of its premises: "the demand to absorb additional output at current prices exists and will continue to expand, thus maintaining adequate producer prices".

Subsequent analysis calls into question the economic potential of expanded SFC production, especially in the absence of concerted action to promote SFC marketing. In fact, while the institutional development objectives of the project may be achievable, in the absence of prompt and effective action vis-a-vis markets, SFC production will continue to sputter along with consequent lack of positive impact on incomes, employment or nutrition. It is this assumption of the PP design which now appears most doubtful and likely to stand in the way goal achievement.

An implicit assumption in examining the administrative viability of the Project was the capability of the DOA to put together and implement an effective, integrated program for SFC expansion, drawing on and involving all key divisions of the Department. The delay experienced to date in formulating an acceptable LOP workplan for DARP, much less actualizing it, calls into question the attainability of the Project's institutional development purpose -- the training, TA, commodities, facilities and special studies will be for naught (at least, in terms of the SFC) if the DOA cannot organize itself to effectively utilize these inputs in support thereof.

#### IV. EVALUATION OF PROJECT COMPONENTS

##### A. Research and Extension Program

###### 1. Research

The DARP has, as a central focus, a program of support for an enhanced research effort on selected SFC by the DOA research establishment. A life of project (LOP) workplan for the enhanced research was called for to spell out priority crops, areas and objectives of the research, approaches to be taken, division of responsibilities, a calendar of action, and projected outputs. The total plan was to encompass not only research, but technology transfer, training, seeds and the interrelationships of these components, as well as the construction and procurement components.

###### Findings/Conclusions

The DARP DAI team produced the first draft LOP workplan, without significant DOA inputs, in early 1986; this was informally approved by USAID and the DOA as the basis for moving ahead with implementation. Several drafts of the 1987 workplan update were developed and circulated, again as basically DAI team efforts, the latest dated June, 1987. The update included documentation of progress, i.e., planned and actual activities and outputs. In September, 1987, the DOA tabled a revised version of the research component of the workplan, relating DOA activities to the more detailed DAI plan, but deleting some elements of the DAI draft, including all activities that were outside the DOA's program mandate (e.g., rural credit). Also deleted were many specifics of the DAI draft, i.e., targets, completion dates, coordination and management changes.

While it may be far from perfect, the DOA effort at preparing a workplan does reflect a developing ownership of a research plan by the DOA research establishment. The basic commodity structure and problem focus of the DAI plan is retained. As the DOA's program budgeting is initiated (we understand beginning for program year 1989) the workplan will need to undergo extensive refinement and exhibit increasing specificity if it is to serve as a basis for development of the management information system to undergird a program budgeting process. DOA and the DAI team need to now initiate an intensive interaction to move ahead with that effort. An important consideration in the research management context is the focus on commodities and on technologies to reduce costs and, thus, enable local farmers to compete with world market prices.

(The reason for attaching such importance to preparing and actualizing a LOP workplan is that it constitutes the first, integrated effort by the DOA to systematically address diversification for the SFC. We would hope that the DOA would also take ownership in the rest of the programmatic elements of the DAI plan, i.e., Extension, Education and Training, Seeds, and Economics, with major emphasis now placed on actualizing the plan.)

From a review of the workplan content and processes, and from other discussions and observations, we conclude that, while it has been somewhat laborious, a great deal of progress has been made in defining and implementing the project's research program. While there has been some slippage in other components, i.e. construction, procurement and long-term training, the research is largely on schedule in spite of the delays. We conclude, also, that the activities represent a meaningful SFC research program for Sri Lanka at this juncture. Priorities seem to be logically set, crops selected generally seem to have potential economic viability, and the anticipated technical constraints seem reasonable.

One research area where progress seems to be limited is in farming systems (FSR/E). We acknowledge that, by its very nature, this is a difficult area in which to show rapid progress, and that the approach is further hampered in the Sri Lankan context by the large number of relevant agricultural research programs outside the DOA, i.e., livestock, coconut, tea, rubber, forestry, fisheries, etc. But, we had expected a bit more to show as follow-up to the apparently excellent FSR/E workshop that was conducted in September, 1986.

We recognize also that FSR/E is but a small part of the spectrum of a total agricultural research program. Major efforts must go into the component technologies, i.e. variety development, pest control, soil and water management, etc., but the FSR/E component is the integrator that both identifies constraints which component research can take on and then integrates results of component research into the farming system at the farm level. As such, it calls upon all disciplines in research, with special emphasis on economics and taking cognizance of the social science dimension. It also calls on Extension and Education and Training resources. The technology transfer component must be an integral part of and attuned to the realities of the farming system if the spread of proven systems is to be expedited. This further complicates planning and implementation of FSR/E, but is essential to its success.

We conclude that further development of the FSR/E concept is needed. We agree with the plan to concentrate FSR/E work, initially at least, to the Maha Illuppallama and Aralaganwila RRCs, where the Mahaweli Authority involvement can facilitate a more integrated approach. The current plan, however, is extremely confined in its approach, and further intensive effort is needed to move the planning to the next level and to generate some initial results.

Another complaint voiced to the evaluation team by both DAI and DOA personnel is the frequent unavailability of funds to meet occasional, small, urgent operational needs. Research activities, in particular, were often hampered due to unavailability of funds to meet short-run operating costs of individual scientists' projects. Timely acquisition of supplies and materials, often requiring only modest funds, can be crucial to success of specific activities.

#### Recommendations

1. A strongly applications-oriented FSR/E consultant (not a theorist but a practitioner) should be provided under DARP funds for at least three months at an appropriate time to assist in developing some practical "next steps" in the farming systems component. Next steps should, we think, be the designing and implementation of two or three pilot FSR/E activities.
2. A small discretionary fund should be set aside in the DAI contract budget to be managed by the COP with the USAID Project Officer's concurrence, to be used to cover such operating costs in research. A reasonable limit on individual purchases agreeable to the COP and AID would have to be negotiated.
3. Consideration should also be given to funding pilot or demonstration activities of the DOA relative to DARP with grant funds through the DOA budget. We understand that the DOA has limited authority to create additional budget line items using donor grant funds. This could be useful in initiating such activities as seed research, breeder and foundation seed units, or a small grant program to cover the research costs for DARP-related research that would be open to both DOA and non-DOA researchers. This would then create a precedent and process for continued funding using GSL consolidated budget resources.

#### 2. Extension

One of the primary assumptions underlying the initial DARP design was that the DOA's extension service would be capable of transferring relevant information regarding agricultural diversification options and technologies to the general farm population. This assumption was based on the presence of an on-going Agricultural Extension and Adaptive Research Project (AFARP) funded by the World Bank, which was instituting the "T&V" extension program, expanding the extension cadre, and upgrading

the DOA's in-service training capacity. The AEARP was also instrumental in actualizing the Regional Technical Working Group (RTWG) process for research-extension interaction.

While the AEARP was successful on several counts, inadequacies in the system remain, which are adversely affecting the agricultural diversification effort. For example, due to recent DOA budget stringencies, the operating budget for field extension has remained extremely limited, with most of the budget going to meet the payroll costs of the expanded field cadre (now totalling some 2,800 employees). Also, recent surveys have revealed that while the "T&V" system has been effective up to the point of the "contact farmer", further dissemination of extension messages has not been up to expectations. Finally, the AEARP did very little to develop extension capabilities in the use of mass media, an area of considerable potential in Sri Lanka due to widespread literacy, radio ownership and even television availability.

On the positive side, the Extension Division has been beginning to get involved in marketing issues, e.g., in attempting to educate farmers regarding market potential and standards requirements, and in promoting contractual agreements between producers and purchasers.

Because of the assumption regarding the effectiveness of the AEARP, the DARP design placed major emphasis in the area of extension on long- and short-term training for extension staff (25 Master's degree and 110 pm, respectively) rather than on upgrading operational capability. DARP has provided six person-months of short-term T.A. in the area of extension, and also has limited resources available for commodity support, primarily in the area of media.

During the course of this evaluation it was not possible to directly assess extension capabilities in the SFCs, or even awareness of DARP, in the field. Conclusions and recommendations, therefore, should be regarded as tentative.

#### Findings/Conclusions

- The Extension and Education & Training Divisions do need additional support if they are to become fully effective in the area of SFCs. Major limitations are in the areas of mass media and market information.
- The short-term technical consultant did propose an extension program for the SFCs, with heavy reliance on mass media. However, there has, as yet, been no official DOA response to this proposal.

#### Recommendations

1. The DOA needs to formulate an integrated plan for extension for the SFCs. The plan should include emphasis on marketing, and the quality requirements for the various market options, as a precondition to a major production push. The Haws completion-of-assignment report may serve as a point of

departure for preparing such a plan. Sufficient marketing experience and insight exists within the Economics and Extension Divisions to address the marketing elements of such a program if it can be brought to bear.

2. DARP should, based on the DOA's proposal(s), make available additional technical assistance (long- or short-term) in carrying out such a program.

#### B. Seeds Program

Given the importance of an assured supply of quality seed to the production of SFC, the project provided for substantial assistance to the Seeds Division (SD) of the DOA, and to the Seed Certification Service (SCS) to upgrade capabilities to deal with these crops. The project also proposed encouragement of privatization in the seed industry.

#### Findings/Conclusions

Over the past dozen years, the SD and SCS have developed a strong capability to handle seed paddy, but only more recently have they begun to devote needed attention to SFC. The evaluation team's visit overlapped that of the team studying the feasibility of restructuring (privatizing) major elements of the seed industry. This provided the benefit of their findings and recommendations, which go far beyond what we would have found possible. We had opportunity to visit three seed processing centers and two seed production farms of the SD. We also met with the DD/SD and the DD/SCS. Our observations closely parallel those of the Feasibility Study Team on matters relating to this evaluation.

We conclude that the team's in-depth observations and their main conclusions and recommendations are eminently sound. We fully endorse them, and commend them to the GSL and to USAID. We think that the time is appropriate for a rapid and smooth transition to an efficient and effective involvement of the private sector in seed production, processing and marketing.

Although there is little evidence of movement toward privatization up to now, we believe that there is strong and broadly based support for such a move. We also observe that the DARP has the capacity, both for further technical assistance and for capital assistance (facilities and equipment) during the life of the project to assist in that transition should the GSL so decide. We do not think that capital investment for needed seed facilities and equipment necessarily conflicts with movement toward privatization so long as those investments emphasize quality and not quantity performance in the public sector. Specifically, DARP should build, in a few key locations, a significantly improved capability to deal with breeder and foundation seed, and procure processing equipment that has potential utility for use by the private sector.

#### Recommendations

1. AID and the GSL should follow the Study Team's recommendations with respect to equipment acquisition, i.e., importation of smaller and/or portable seed processing equipment.

2. Provision should be made for improved office and laboratory work space, and for equipment and conditioned storage at the three or four locations where breeder and foundation seed would be handled-- i.e., for the proposed "Varietal Maintenance Units" and the Seed Division's foundation seed program.
3. USAID should maintain flexibility through DARP to provide at least one additional year of technical assistance by the seed specialist should the GSL decide to move ahead with most, if not all, of the basic restructuring recommended by the Study Team. We believe such assistance should be accorded high priority in the programming of DARP resources.
4. USAID should be prepared to support the use of other, non-DARP resources (e.g., PL 480 local currency generations), to support a logical program for development of a private seed industry.
5. As noted in the above section on research, discretionary funds should be made available in limited amounts for use by the DAI team for work relative to SFC seeds. Also, DARP grant funds should be channeled through the DOA budget to support pilot efforts related to improvement of the seed industry.

#### C. Social & Economic Studies

##### 1. Overview

The PP called for "a continuing series of . . . social and economic studies," to provide programming input, support project monitoring and evaluation, and develop indigenous capacity to plan and undertake such studies. These studies were to be undertaken at both the micro- and macro-levels, and were to be the responsibility of the Division of Agricultural Economics and Projects (DAEP). A senior Sri Lankan sociologist or anthropologist was to assist the DAEP in planning and carrying out the program. DARP grant funds totaling \$280,000 were made available specifically for implementing the social and economic studies component. In addition, the project provided for both long- and short-term T.A. (24 p.m. and approximately 10 p.m. respectively) to assist the DAEP in getting the program started. Oversight and direction of the overall program was to be the responsibility of a Social Science Review Sub-committee (SSRS), to be established under the project.

##### Findings/Conclusions

While the role of the SSRS has been fairly insignificant to date (see discussion below), the overall program of studies has gotten off to a fairly good start with the assistance of the long- and short-term T.A. (both of which are now at, or in excess of, the proposed PP levels). Specific accomplishments to date include the following:

- The baseline study (also discussed in more detail below) has been completed and the data are now being entered and analyzed.

- Studies by the regional agricultural economists (RAEs), under the guidance of the DAI long-term agricultural economist, on production trends and regional production and marketing for SFCs, have been completed or are in the process of editing and revision. These studies have proven both informative as well as instructive for the RAEs.
- A study was completed in the economics of seed production on selected government farms, which has proved very useful in the subsequent work of the the team considering the possible restructuring of the Sri Lanka seed industry.
- Steps have be. undertaken to upgrade the quality, reduce the cost, and expand the analytic potential of the DAEP's regular cost of cultivation surveys.

Based on the above studies, a review of relevant literature, and additional analytic work by the DAI long-term agricultural economist, the following conclusions regarding the economics of agricultural diversification can be advanced:

- The production and extent cultivated for most SFCs has increased significantly over the past 15 years. Yields, however, have remained stagnant. While technologies exist that would result in significant increases in yields and productivity, the incentives do not appear adequate to stimulate a move to a new technological plane.
- Local production is at or near the point of satisfying effective local demand for most SFCs-- there appears to be little potential for significant expansion of the domestic market (possible exceptions are maize and soybean).
- "Efforts to expand the consumption and demand for most SFCs are a precondition to approach the nutritional goals, and also to motivate more production at the farm level, with the concomitant improvement in rural employment and income."\*
- Marketing "is the weakest link in the production-distribution system for SFC."\* Problems include poor coordination of price and import policies and programs, inadequate information, inadequate storage and processing, poor quality control, high cost of credit.
- Most producers of SFCs seem motivated by a predominantly subsistence orientation, even though most production ultimately enters market channels. SFC production is generally secondary to paddy production and is designed to minimize risk and cash costs, in spite of demonstrated high returns to capital.
- Unit costs of production are relatively high due to the low levels of technology generally employed in SFC production, with the domestic production costs of many SFCs near, or in excess of, world market prices.

\*Navarro, End-of-Tour Report (Draft), September, 1987. .

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Based on a ranking system taking into consideration foreign exchange earnings/savings, extent of local cultivation and consumption, contribution to GDP, and production potential and demand (current and potential), Navarro arrived at the following suggestions for crop priorities under DARP:

First Priority	:	Cowpea, Greengram
Second Priority	:	Chillies, Onions
Third Priority	:	Maize, Blackgram, Sesame, Groundnut, Soybean
Fourth Priority	:	Potato, Manioc, Sweet Potato, Finger Millet Sorghum*

The above constitutes a significant body of information relative to agricultural diversification for consideration and action at the policy and research/extension programming levels. In addition, an agricultural economist has been assigned to the DAEP in Peradeniya and charged specifically with undertaking market-related research. The urgent need at this point is to expand and follow-up on this start, provide additional resources to support marketing analysis and promotion, and to see that the results of these and further analyses do, in fact, find their way to decision makers for consideration and relevant action. (see Annex V for further discussion of economic considerations in agricultural diversification planning.)

As noted above, economics rather than available technology appears to be the primary constraint to rapid and significant expansion of SFC production. Urgent action is needed at all levels to expand and improve relevant analysis and to effectively integrate economic (especially marketing) considerations in policy and program decision-making. Due to the inter-ministerial and foreign trade implications, the MADR must take on the lead role in promoting and facilitating SFC market expansion. Specific recommendations are as follows:

#### Recommendations

1. The capacity and role of the DAEP should be significantly upgraded, with the DAEP taking on an increasing analytical and advocacy role regarding SFC-related program and policy decisions. Steps should be taken to further ease the routine data collection and compilation burden on the DAEP, freeing up resources for more important analytical work. (e.g., the adoption of an area frame sampling methodology would simultaneously reduce the workload and collection cost, and improve the quality of basic agricultural data.)
2. The MADR needs to move quickly and effectively to bring about improved coordination of domestic SFC procurement and imports, and to promote expanded exports.

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\*Ibid.

3. DARP social and economic research funding needs to be made available for increased marketing research, either through the Social Science Review Subcommittee or through the DAEP's budget.
4. Research and extension both need to devote more attention, at least initially, to cost minimizing rather than yield maximizing technologies, with the objective of achieving significant reductions (below world market prices) in SFC production costs.

## 2. Social Science Review Committee

The PP called for the establishment of a Social Science Review Sub-Committee (SSRS) to oversee the overall DARP program for social and economic research, to be formally constituted by the PMC, chaired by the DD/DAEP and include among its members a senior Sri Lankan sociologist or anthropologist. This committee was officially established by the PMC in May, 1985. DOA membership included the DD/DAEP (Chair), one representative each from the Research and Extension Divisions, the USAID rural sociologist/evaluation officer and the DAI long-term agricultural economist. The SSRS first met in May, 1986. After reviewing possible candidates, Dr. Tudor Silva of the University of Peradeniya's Department of sociology, was invited to participate on the committee in August, 1986.

### Findings/Conclusions:

Since its establishment the SSRS has been relatively inactive. It has formally met only three times since its founding, and its actions have consisted largely of reviewing and approving the work program of DAI agricultural economist Dr. Navarro (in June, 1986). The committee has also agreed to set up and publicize a small grant program (up to Rs.60,000 each) open to all Sri Lankan social scientists on a competitive basis for work on issues related to agricultural diversification. This suggestion was subsequently endorsed by the PMC in April, 1987. However, no further action has been taken in terms of implementing such a program. (Although not yet formally publicized, one proposal has been submitted for review.)

### Recommendation:

Immediate steps should be taken to energize the Social Science Review Sub-Committee and step up its activities, including initiation of the small grants program. While the main socio-economic problems relative to agricultural diversification appear to lie in the area of marketing and price policy, much work is needed on such topics as the interrelationship of land tenure, scale of operations, labor availability and distribution and credit on farmers' production and marketing decisions, and on farmers' perceptions leading to resource allocation and marketing decisions.

### 3. Baseline Survey

A baseline survey for DARP was explicitly planned as a means of (1) assessing changes in SFC production and marketing over time that may be attributable to the project, and (2) adding to the existing store of knowledge regarding SFC production and marketing, in order to facilitate agricultural diversification planning and implementation. The baseline survey was planned to get underway with the 1985-86 Maha season, continuing through the 1986 Yala season. Timing for data analysis and preparation of reports was not specified in the PP, but the T.A. consultant for the survey had anticipated completing the reports by mid-1987 (approximately nine months after completion of the field work). Rather than contract out the entire job, which might have facilitated the data collection and analysis, it was decided to implement the survey through the DAEP, substituting it for the normal cost of cultivation (COC) surveys implemented by the DAEP for those two seasons.

#### Findings/Conclusions

Short-term T.A. was provided for the design of the survey in late 1985, and the field work was, in fact, implemented on schedule. The sample size totalled 4,200 farms. (A copy of the questionnaire is provided in the appendices.) The same consultant then returned in mid-1987 to assist in the analysis of the data and preparation of the survey reports. However, finalization of the baseline survey results has been delayed due to major problems in data entry.

Due to limited personnel and inadequate computer terminals in the DAEP (the latter partially a result of DARP procurement delays), the decision was made to contract out the actual data entry. This contract, between the DOA and Computer Link of Colombo, using DARP funds, was effected in May, 1987. Unfortunately, the contractor turns out to have grossly underestimated the amount and complexity of work involved, with the result that the data entry has fallen far behind schedule. The follow-up technical assistance has been almost entirely consumed with correcting errors and overseeing the data entry. The upshot is that the initial analyses will not be completed until January, 1988, at the earliest--approximately 8-9 months behind schedule.

In spite of the delays, the baseline survey is proving a valuable learning and institutional development exercise, and should also meet its informational objectives, albeit later than planned. The DAEP has benefitted considerably through the experience: it has implemented a major national sample survey on schedule, utilizing its own field personnel, and the sample frame developed for the baseline survey (a smaller sample than heretofore used by the DAEP for SFC-related surveys) is now being used for its regular COC surveys, resulting in a saving of time and personnel resources and better (more statistically sound) COC data.

The survey findings will enable monitoring of SFC production and marketing trends, will provide sex-disaggregated labor input data to facilitate extension programming, and should also provide a basis for development for the first time of production functions for key inputs. The initial survey report by the short-term consultant will summarize the key findings, and will also suggest further analytic possibilities using the data generated.

For the follow-up survey (close to the PACD), it may be possible to further reduce the sample size, depending on the quality of supervision. The provision of additional computer equipment through DARP should make it possible for all aspects of the survey, including data entry and analysis, to be done within the DAEP, thus eliminating some of the confusion and waste, and further developing DAEP capabilities.

The delay in the availability of baseline survey data may have impeded development of the overall LOP work plans. However, the process has been an important and worthwhile learning experience, and the information generated should meet the objectives.

Recommendation:

Due to the time and resource requirements, an update of the full baseline survey, employing the same sample frame, should be undertaken only once more during the LOP, to provide input for the end-of-project evaluation. Resources should be provided (if not already undertaken) so that the DAEP can undertake the entire update 'in-house', so as to facilitate processing and analysis and further develop DAEP capabilities.

B. Participant Training

Probably the most salient problem confronting DARP at this time is the implementation of the academic training program. The original Training Plan (Annex B.8 of the PP) called for a total of 61 advanced degrees (8 PhD, 53 Masters) to be supported through the Project, the bulk of them (26) from the Research Division. Long-term training was to be provided in the U.S., third countries and, "to the maximum extent possible at Sri Lanka's University of Peradeniya (a minimum of 25 percent . . . at the latter.)" It was proposed that most trainees would complete at least one term at the University of Peradeniya's Post Graduate Institute of Agriculture (PGIA) during the course of their programs, with a goal of awarding half of the masters' degrees from PGIA.

The rationale for setting up the training in this way was to: (1) increase the relevance of students' work to local problems; (2) expand and diversify the training opportunities; (3) increase the effective role of the PGIA (supported under an earlier AID project) in Sri Lanka's agricultural development and promote closer integration of the PGIA and the DDA; and (4) reduce the potential for participant attrition. Detailed training plans, specifying individuals, degree programs and institutions, were to be prepared under Project auspices and updated regularly during the LOP. However, in what may be considered a design flaw, the actual mechanism of the split between PGIA and overseas training was left to be worked out in the course of implementation.

## Findings/Conclusions

The initial detailed training plans and budgets were worked out by the training subcontractor (IIE--the Institute for International Education) with DOA input, utilizing different scenarios for the mix of U.S., Sri Lankan and third country training. This plan called for some students to pursue their studies entirely at PGIA, some to obtain U.S. or third country university degrees (with in-country research), and some to undertake course work at U.S. universities followed by in-country research work and award of degree from PGIA. A program of this complexity, however, posed major administrative problems. Also, it was criticized by some participants who would not have an opportunity to pursue overseas studies.

Therefore, in the interests of simplified management and maximum U.S. academic exposure the Project Management Committee (PMC) decided, with the concurrence of the Project Coordinating Committee (PCC), to go to an across-the-board "split degree program", whereby all participants would undertake their course work at a U.S. or third country university and then return to Sri Lanka for research and receive their degrees from PGIA. Provision was made for exceptions, in cases where it was determined that the PGIA would not be able to provide the necessary facilities or supervision. However, these would need to be well-justified and approved by the Director of Agriculture and USAID). A partial chronology of PMC and PCC action relative to the role of the PGIA and the split degree program, along with the full rationale for going with the split program, is contained in a USAID file memo of July 16, 1987 (Appendix VII).

The problems that have arisen are of two broad categories: One is that of implementation details, sorting out the relative roles and responsibilities of the trainee, the training contractor, the DOA and PGIA for a completely unprecedented academic training program; the other, and more serious, is that of the vehement objections of the DOA's Research Officers and Agricultural Graduates Associations to the split training on a number of grounds, raising the possibility that the whole academic training component (the element of the Project with the greatest potential long-term benefit) may be seriously undermined.

A summary of the objections and complaints regarding the split degree program, from a document issued by the above-mentioned organizations, is contained in Appendix IX. The main issues raised are as follows:

- The PGIA is not equipped, either in terms of facilities or qualified academic staff, to provide training of an acceptable standard to DOA officers;
- The split degree program is largely a PGIA initiative, attempting to compensate for deficiencies in its program;

- The DOA has no clear policy regarding training of its personnel, and therefore is forced into a strictly reactive position to PGIA and donor initiatives; and
- The cost savings of a split program are largely illusory, especially in view of the extended duration and reduced quality of the education.

While some of these assertions are clearly unsubstantiated, others do have some basis in fact. And, as long as they are perceived as correct and unresolved by the majority of the potential participants, the potential for damage to DARP (the overall project as well as the training component) is significant.

A total of 24 students have begun their long-term training under DARP as of September, 1987 (See Appendix XI). Some others are in the process of gaining admission, completing GRE and TOEFL requirements, etc. However, a number of promising candidates have opted not to apply for training under DARP, anticipating a better offer from another source. Seven participants have returned from their U.S. academic training and are currently enrolled at the PGIA for in-country research. Another three participants are expected back by the end of September. Almost without exception, these returned participants complain (not entirely without justification) of problems in arranging their research supervision, preparing their proposals, finding appropriate in-country equipment and facilities, inadequate research budgets, no provision for subsistence allowances, travel and per diem. Some of these are simply the "shake-down" problems encountered by any innovative program, a number of which appear on their way to resolution. Some, however, are more fundamental and, along with the contention regarding the overall inadequacy of the PGIA, will require prompt, careful and effective action.

The short-term training program, in contrast, is proceeding smoothly and appears to be having significant positive impact. A total of 482 person-months of short-term training were initially programmed in the PP. As of September, 1987, a total of 202 person-months had been completed, in Sri Lanka, the U.S. and third countries (primarily the International Agricultural Research Centers). A complete list of short-term training completed to date is contained in Appendix VIII. Seminars are regularly scheduled in the DOA at which returned participants report on their training. By all accounts these are well-attended and informative. The only problem that surfaced relative to the short-term training program is the complaint from some personnel at the Regional Research Centers that they were not being kept informed regarding the short-term training possibilities under DARP.

#### In Summary

- The training contractor (IIE) has performed effectively to date in implementing both the long- and short-term training programs.
- The long-term training appears to have been pushed along faster than it should have been, especially in view of the innovative nature of the split degree program---study programs were not

- thoroughly reviewed in advance by the DOA and were often not fixed prior to students' departure, PGIA contacts and course requirements were often ignored, inadequate provision was made for students' return in terms of allowances and research arrangements.
- The PGIA does have the capability to provide adequate research supervision for most of the fields of study contemplated under DARP, especially at the master's degree level. At the PhD level the PGIA's capability is more questionable.
- The rationale for the split degree program appears sound. In the interests of equity and ease of management, some of the best training candidates who could gain admission and do well in a first-rate U.S. university may end up with a lesser quality education. However, the split program does extend the benefits of U.S. university training to a larger group. There is provision for the split degree program requirement to be waived if an adequate case can be made.
- The implementation design was deficient in not addressing the additional workload being imposed on the PGIA. Its administrative, supervisory, computer and library facilities are being taxed by the influx of DARP participants on research degree programs.
- The IBRD-funded ARP is also going for split degree programs for DOA participants, but with the actual degree to be awarded by the overseas institution.
- Based on discussions with PGIA and other donor representatives, it appears that the in-country research allowance (\$1080/student/year) may be inadequate.
- The DOA has not, in the past, had an effective training or manpower development policy. Hence, actions have tended to be ad hoc, reflexive, with little central coordination, review and follow-up.
- The short-term training program seems to be moving along well. Broader publicizing of the short-term training options does appear warranted.

#### Recommendations

1. Continue with the split degree programs for master's degree candidates. For PhD candidates, the need for the highest possible quality combined with timely completion argue in favor of a U.S. degree program, with research carried out in Sri Lanka. For the balance of the long-term participants, more careful review of study and research plans is essential in order to assure that facilities and supervision are available in Sri Lanka. Where this is not the case, and the training is high priority for the DOA, waivers of the split degree policy should

be granted. (It should be noted that the unequivocal commitment of the DOA to the split degree program is essential if it is to be implemented at all, much less be regarded as successful.)

2. For the balance students under a split degree program:

(a) Move quickly to address legitimate grievances (subsistence, - i.e., a monthly living allowance - travel, per diem, timely appointment of committees) and improve coordination between the PGIA and DOA for the conduct of research.

(b) Explore the possibility of joint degree programs with U.S. universities. This should mitigate some of the students' complaints regarding the value of their education and the quality of research supervision. This may require limited additional funding for a U.S. committee member to participate in research design and supervision, but the result should be worth the expense.

(c) Arrange for U.S. universities to provide participants with certificates recognizing their successful completion of a program of graduate course work.

E. Management and Coordination

One of the four major components of DARP, and one that is essential to achievement of the project purpose, is the development of improved ability within the DOA to manage integrated programs, involving several divisions, supportive of SFC production and marketing. This is necessary if the several components of DARP are to become an integrated whole. The several divisions involved, and the generally decentralized management employed by the DOA make this a difficult matter with which to content.

One major complication at this point is the likelihood of significant devolution of powers and resources from the center to provincial or regional authorities. As a result, administrative and management changes are on hold until the details of these arrangements are known. However, it is our opinion that the basic principles of management will apply in any event, and that this should not preclude moving ahead with this element of the project.

Findings/Conclusions

As mentioned elsewhere, a beginning point in management and coordination is in the planning of activities and their integration into a cohesive plan of action. Although the DAI-drafted plan for SFC research is now in its second generation, and has been available for comment by the DOA for nearly 18 months, the first definitive response came only in September, 1987, and that response was developed without the degree of consultation among the different divisions and with the DAI team that would be desirable.

Planning of inter-organizational research requires intensive interaction throughout the process, which has not adequately occurred to date in DARP. As a result, the project workplan may be flawed in terms of its ultimate utility. Other components of the DAI drafts did receive more prompt review, we understand, perhaps because the organizations dealing with extension, training and seeds are more centralized in their planning and response capability.

A need central to management and coordination of complex activities is effective communications. This is one major recurrent problem observed by the team and brought to our attention repeatedly. We were not able to pinpoint why information flows were incomplete or impeded, but for whatever reason, important information was either not received or not acted upon in a timely or effective manner. We suspect that a part of the problem is an overload in the system, especially for key managers and decision makers. As noted above, the project is a complex one involving nearly all divisions of the IOA. Resolving a "lack of information" problem may be more a matter of insuring that the right information is flowing to the right people than of attempting to put all information through everyone's in-boxes. Everyone needs information, but no one needs it all.

One measure of the effectiveness of management and coordination is the development of linkages that promote sharing of information and harmonious collaboration and cooperation. The team was not able in the time available to fully assess the existence or effectiveness of linkages that exist or are developing among the several entities involved with the IOA SFC program or the DARP-supported activities. We did get the feeling that the DAI team, both long- and short-term, had developed good working relations with counterparts. We conclude that progress in building linkages with the International Agricultural Research Centers and Institutes and with other national research, extension and seeds programs has been quite good. A major factor in this regard has been the training program, especially short-term, and the short- and long-term consultancies provided in support of the SFC program.

We also heard favorable comments concerning the cooperation and linkage-building underway at the regional level through activities of the Regional Technical Working Groups. These seem to be filling an important and useful purpose. We are less sanguine about the effectiveness of working relations among research, extension, training and economics at the national level, or about the performance and impact of the national coordinated research activities recently initiated. Our discussions and observations suggest the latter to be a rather mixed bag, with some being quite effective and others leaving something to be desired. We have no particular recommendation in this regard except to suggest that MADR and IOA leadership continue to monitor these relationships and to search for organizational or other means to improve or simplify linkages and thus enhance the effectiveness of working relationships. In the case of the coordinated national research, management should continue to seek effective leadership and ways to help coordinators and the coordination committees to effectively function, as this will be one of the most important means of implementing an integrated, national diversification program.

Coordination between the DOA and the PGIA--essential to the successful implementation of the academic training element of the project, as well as the effective mobilization of resources in support of the GSL's overall agricultural diversification objectives--is also mixed, with determined efforts underway in some quarters to undermine this relationship. This is discussed in more detail in the section on participant training. However, it also applies in the area of research collaboration.

Finally, the prevailing management/administrative system of the DOA, like that of many, if not most, government bureaucracies, is very rigid and regulated, with high priority on seniority and little incentive to produce. There is, for example, no program or procedure whereby outstanding or even above-average performance can be recognized and rewarded. Motivation of personnel, in such a system, becomes a major problem for managers who are attempting to achieve set targets.

#### Recommendations

1. A series of workshops, perhaps jointly funded by DARP and the World Bank-funded Agricultural Research Project (ARP), dealing with management information systems, and program planning and budgeting would be helpful. These could be scaled to manageable segments, e.g., research, where commonalities might be conducive to more productive exchanges.
2. A short-term consultant, funded through DARP, specializing in information management in technical organizations, i.e., research, extension, education and training, should be provided to make an assessment of information management processes and problems in the DOA. A modest investment in such assistance could pay large dividends by helping to assure that information processes accommodate the needs of management and operations at all levels.
3. A set of more generalized management training activities should be initiated to sharpen skills, particularly at the middle management level. A number of firms and institutions have had extensive experience in this area. If not available in Sri Lanka, it is possible that such talent may be available elsewhere in South or Southeast Asia.
4. DARP should promote and support innovative management steps within the DOA, e.g., in providing recognition and, possibly, cash awards for research or other work determined to be particularly significant by a panel of peers or superiors.

#### F. Technical Assistance Contractor Performance

The current contract with DAI calls for 180 person-months of technical assistance--120 long-term and 60 short-term. In addition, the contractor is to negotiate subcontracts for training activities performed under the project and for provision of local support services.

The main purpose of the long-term TA, as envisaged in the project design, is to work collegially with and provide support to counterparts or counterpart teams. In research, for example, each TA expert works with one or more DOA research officers in the field, under the overall direction of the regional DD/Research, to plan a program of research, design and conduct experiments based on sound hypotheses that elaborate elements of the workplan, and to analyze data obtain, interpret the results, and write the reports and publications documenting the research. Other purposes are to stimulate other professional activities, develop training materials, and conduct training sessions for DOA staff.

### Findings/Conclusions

The contractor performance, in terms of timeliness in providing long-term technical assistance advisors and in organizing and implementing subcontracts for training and for local support, has been quite adequate. While there have been a few delays, there is no question but that the contracted services will be delivered prior to the end of the current contract in August, 1990, regardless of any action regarding additional TA.

There is strong consensus among all parties that the long-term TA team is an excellent one. The substantial array of international experience brought by the team's members permitted them to hit the ground running, and it seems clear that the long-term TA is having a major positive impact. Although the DOA counterpart staff, especially those outside Peradeniya, tend to be young and relatively inexperienced, the team has been able, due to the experience and commitment of its members, to establish effective working relations with them. Soundly designed experiments are in the field, and quality data is being collected and analyzed.

Short-term TA has likewise been generally well-received and productive in dealing with specific problems or activities, e.g., the baseline survey, training and manpower assessments, preparation and conduct of two major workshops, the seed feasibility study. A major study of seed privatization feasibility has been performed, and a variety of useful documents and training materials have been prepared.

Especially noteworthy accomplishments of the prime contractor were the organization of and assistance in implementing the FSR/E and the seeds workshops. Also noteworthy are efforts in development of a LOP workplan and update, and the substantial initiative and leadership of the seed specialist leading up to and during the seed feasibility study.

Although the administrative costs in the training program seem quite high, there is general satisfaction with the performance of the training contractor, the Institute for International Education (IIE). Arrangements for trainees' departure from country and arrival at U.S. universities have generally been performed in a timely and satisfactory manner. So far as the team could ascertain, no serious complaints in that regard have been lodged. IIE has not been as responsive as it might have been to requests that they explore with U.S. universities ways to

involve them and individual faculty members in the continued program of participants upon their return to Sri Lanka to carry out their research. Some options for this kind of interaction are presented in the participant training section of this evaluation report.

All-in-all, we give the Contractor good marks. The team members seem to have developed good working relationships with the DOA and USAID, and individual team members seem to have settled fairly quickly into productive working relationships with counterparts.

As of the date of this evaluation, both the long- and short-term TA currently in the DAI contract appears to be fully committed. Details of both long- and short-term assignments completed to date appear as Appendix VI. Thus, unless additional resources are committed, the last short-term assignment, aside from the jointly-funded soybean expert who extends to March, 1988, will be completed in October, 1987. All long-term TA will be gone in less than eleven months from the date of this evaluation--two years before the termination date of the DAI contract, and four years before the PACD. We see these as sobering facts that portend serious negative consequences for the success of the project.

Most of the degree participant trainees will return after all expatriate staff have departed, so that those in the SFC programs of the DOA who could perhaps profit most from interaction with the expatriate experts will be deprived of that opportunity. As discussed elsewhere, the haste in fielding TA resources may have been a design and/or contract flaw.

At this point in project implementation, in order to continue and build on the momentum developed to date, substantial additions seem needed to both long- and short-term TA--at least up to the levels originally planned in the PP (138 PM long-term, and 96 PM short-term). Going somewhat beyond this, we suggest doubling the short-term TA and increasing the long-term by roughly 50 percent over what is now in the DAI contract. While we cannot, at this time, specify all the likely TA needs for the remaining life of the project, we can predict with considerable certainty that further needs will arise, in the absence of which the attainment of project objectives may be jeopardized. Some suggestions for specific additional TA are contained below, and also in other sections of this report.

Additional TA needs that have been suggested by the DAI team or personnel of the DOA include plant breeding, extension, additional assistance in marketing economics, plant pathology, and entomology. Each of these certainly has merit. Beyond extension of the COP, agronomist and seed specialist, we think that additional long-term TA should include a legume breeder for a period of at least eighteen months in order to provide leadership to returning scholars and to present DOA staff in a high potential area for agricultural diversification. Otherwise, it is our view that, with the presence of a COP for at least one year beyond the current commitment, most of the remaining needs can be met by carefully selected short-term assistance.

If the decision is made to increase the TA for DARP beyond the current contract level, it is absolutely essential, in our opinion, that the next increment be provided through an amendment to the present contract, rather than rebidding. Section H.3 of the current contract provides for this option, which should be exercised. TA needs beyond that could be provided through other direct mechanisms (e.g., IQCs, PSCs, PASAs), but would need to be closely coordinated with the DAI inputs. However, it is vital that the continuity and mutual confidence established to date between the members of the DAI team and the DOA not be disrupted if additional TA is to be at all effective.

### Recommendations

1. Extend the COP for at least one year or (better) eighteen months. We believe that withdrawal of the COP in eleven months would place the program at considerable risk. His presence is needed to continue to properly manage and coordinate TA and training activities and provide overall management input.
2. The services of the agronomist for an additional year would permit overlap with key trainees as they return to duty in DOA research, and would facilitate institutionalization of the improved research activities and procedures initiated.
3. Much of the soil and water management work initiated under DARP can and should be continued through the new Mahaweli Agriculture and Rural Development (MARD) Project, provided there is not a major delay in arrival of that TA team. This can be supplemented with some short-term TA in the interim.
4. Should the GSL elect to follow the direction suggested by the Seed Feasibility Study Team, extending the seed specialist for an additional year would be essential. In any event, either long- or short-term assistance will be needed when the new seed processing equipment is installed and tested, and personnel trained in its use.
5. Provide a legume breeder in early 1988 for an eighteen month assignment.
6. Make available an additional 60 pm of short-term TA. Several needs have been identified in this report, and others will undoubtedly surface over the remaining life of the project.
7. Exercise the option in Section H.3 of the DAI contract. Meet any further TA needs through direct means, e.g., PSCs.

## G. Other Project Components

### 1. Construction

The PP proposed construction of facilities at seven Regional Research Centers (Maha Illupalama, Makandura, Karadiyan Aru, Killinochchi, Bandarawela, Girandurukotte and Angunakolapelessa), and five seed farms/processing centers (Pelwehera, Paranthan, Bata Ata, Aluththarama and Nikaweratiya). Facilities were to include research laboratories, equipment workshops, storage facilities (including some refrigerated stores), seed processing structures and staff quarters (see Appendix XIV). Architect and engineering (A&E) services were to be provided by a local A&E firm under contract to the DOA. Construction was to be effected through an unspecified number of local private construction contracts, with primary construction supervision by the A&E firm and AID funding by means of FAR. The total project construction budget (including A&E services, inflation and contingencies) was \$1,385,350, of which the AID loan was to provide 75 percent (\$1,039,000). The breakdown of costs for AID and the GSL (at Rs. 25=\$1) was as follows:

	AID (US\$)	GSL ( '000 Rs. )	TOTAL (US\$)
Engineering	64,260	535.5	85,680
Construction	667,440	5,562.0	889,920
Contingency	73,170	609.75	97,560
Inflation	<u>234,143</u>	<u>1,951.175</u>	<u>312,190</u>
Total	1,039,013	8,658,425	1,385,350

The initial schedule in the PP envisaged award of the A&E contract midway through the first year of implementation (i.e., 2/85), initiation of construction (at six sites) during the second year (9/85-8/86), and completion of construction by September, 1989. This schedule turned out to be wildly optimistic in terms of activity start-up, but may yet turn out to be fairly accurate in terms of completion.

### Findings/Conclusions

Because the use of an A&E firm was unprecedented for the DOA (which heretofore has done its own design and supervision), the specification of the terms of reference, prequalification, evaluation of bids and award of contract for A&E services took much longer than initially scheduled--the contract was not signed until April 30, 1986. Detailed design and preparation of the separate construction contracts has taken roughly another year, in large part due to changes in design and site plans suggested by the DOA and the technical assistance team, so that construction will not actually get underway until the third year of implementation (9/87-8/88). (See Appendix XII for a complete chronology of DARP construction-related actions.)

During the past year USAID has had to be actively involved at virtually all stages, dealing with both the A&E contractor (Resources Development Consultants--RDC) and the Civil Engineering Division of the DOA, reviewing and finalizing plans, BOQs and cost projections, rectifying discrepancies and generally acting as both an A&E firm and a contract monitor. However, procedures are now generally established and understood and the initial four construction "packages" (which, in turn, are broken down into two or more separate contracts) are finalized, with one set of contracts awarded and the others to follow within the next one or two months. As a result, USAID's workload relative to DARP construction should see some reduction over the remainder of the project.

The on-going civil disturbances in the north and east of the country necessitated adjustments in the construction plan early in implementation--the Karidiyan Aru RRC was dropped and Killinochchi RRC and Paranthan seed farm/processing center were deferred until the security situation improved. The initial A&E contract therefore deleted any reference to these sites. With the recent signing of the peace accord, plans are underway to proceed with the work at Killinochchi. Also, with the recent upgrading to RRC status of Aralaganwila Research Station in Mahaweli System "B", and the planned AID Mahaweli Agriculture and Rural Development (MARD) Project with its primary focus on System "B", the construction originally planned for Karidiyan Aru is being reprogrammed to Aralaganwila. Moving ahead with work at these three sites will require an amendment of the A&E contract.

As noted above, the total AID budget for construction is \$1.039 million. The present A&E contract amount is for Rs.3,296,832, or approximately \$111,400 at the present rate of exchange. AID's share of this (75 percent) is approximately \$83,500. The inclusion of work relative to the Aralaganwila and Killinochchi sites will necessitate an amendment to this contract and upward revision of the budget. The latest analysis of DARP construction costs is shown in Appendix XIII. It therefore will be necessary to reallocate loan funds within the overall project budget to make up for this shortfall.

Under FAR procedures the GSL must make all payments for construction work, with AID reimbursing 75 percent of the agreed costs only on acceptable completion of the work. This means that the total construction costs must appear in the DOA's budget. This has been the case for GSL budget years 1987 and 1988, and there is no reason to doubt the continued financial commitment of the GSL to the construction component of the project. (The delays in initiating the construction have posed some difficulties for the DOA, which has budgeted for DARP construction and then had to return budgeted funds and account for the underexpenditure.)

All of the construction contracts call for completion of work within eighteen months of the date of the contract. If the four construction "packages" currently in process can be contracted by the end of CY 1987, construction activity should be completed by mid-1989; i.e., at the time proposed in the initial PP construction schedule. The planned addition of Aralaganwila and Killinochchi will extend this date but, absent renewed civil strife, final completion of all construction may be possible by the end of CY 1989.

#### In Summary

- While there have been delays, the construction element of the project now appears to be making acceptable progress in accord with a revised implementation schedule. As noted above, it may be necessary to reprogram some loan funds in order to cover cost increases. However, no immediate action is required, and no change in current construction procedures appears warranted.
- There does appear to be some confusion in the DOA over the work at the Aralaganwila RRC, and what is proposed for funding under DARP and what under MARD. Also, facilities are apparently proposed for funding under ARP at several of the same locations as DARP (e.g., Aralaganwila, Maha Illupalama). It is essential that USAID and the Bank coordinate closely to assure that there is no overlap, waste or ill-considered phasing of facilities improvement at these sites. (There are clearly enough facilities needs at these sites for both DARP and ARP to make positive contributions. It is only necessary to assure that the programs are mutually supportive and properly phased.)

#### Recommendations

1. No changes are necessary in procedures, other than closer coordination and more timely action on the part of the DOA to determine and finalize requirements, sites and designs.
2. The construction programs under DARP and ARP need to be closely coordinated among all three parties (USAID, DOA & Bank).
3. In view of the possibility of significant change in the role of the DOA Seeds Division under an industry restructuring program, USAID and the DOA may wish to reconsider certain seed processing facilities not already too far along in the contracting process, to assure that the overall program is enhanced by the facilities upgrading.

## 2. Commodity Procurement

### Findings/Conclusions

Commodity procurement usually turns out to be a major headache for all AID projects-- DARP is no exception. The PP budgeted \$2.26 million in loan funds for commodities (mainly vehicles, farm equipment, seed processing equipment and laboratory equipment), to be expended primarily in 1985 and '86. (The PP commodities list and a list of commodities procured or ordered to date are contained in Appendices XVI and XVII.) Host country procurement was the chosen mechanism, with overseas procurement to be effected through a PSA, also under a host country contract. This represented a new implementation procedure for the DOA, which heretofore had directly procured all its commodities.

The implementation record to date (thru 9/87) is that AID has accrued expenditures of only \$444,000. A PSA contract with AAPC was not signed, due to a failure to come to term with the initially-selected firm, until December 11, 1986. The initial PIO/C was dispatched in January, 1987. All bids under this PIO/C were declared non-responsive in August, 1987. A new set of bids and bid analysis, under informal procurement procedures, for this PIO/C have now been received. However, as of the date of this evaluation no procurement has been effected through the principal procurement mechanism, i.e., the PSA. (A full chronology of events relative to PSA selection and commodity procurement is contained in Appendix XVIII.)

The use of HC procurement means that AID Handbook 11 rules and procedures apply but, also, that GSL procedures must be followed. GSL regulations impose limits to procurement authority at various levels. At present, all procurements above Rs.5 million (approximately \$177,000) must go to a Cabinet-level Tender Board, (CTB) which can result in significant delays (usually several months) in effecting procurements. The PSA contract amount itself did not exceed this amount, but because it represented a new procedure and a total commodity procurement amount in excess of Rs.5 million, it was referred to a CTB. It has apparently since been decided by the GSL that since the initial PSA award went to CTB, all procurements through the PSA must also go to a CTB, regardless of the amount. This has all resulted in major implementation delays. An additional delay was caused by a GSL tender board determination of non-responsiveness of the initial bids, and this may, in part, be attributed to the instructions provided by USAID in the PIO/C.

Virtually all commodity procurement effected to date has been local procurement directly by the DOA (with reimbursement or direct pay by USAID). This seems to be proceeding relatively smoothly, and only slightly slower than planned.

### In Summary

- The overall delays in commodity procurement, regardless of cause, have resulted in reduced effectiveness of the T.A. team and may impair the in-country research of long-term training participants.
- The GSL has made adequate budget provision for commodity procurement (cost as well as taxes and duties must be reflected in the DOA budget), but now is faced with justifying the significant degree of under expenditure. (The DOA has requested a "revote" for 1988 of the funds unexpended in 1987.)
- Off-shore procurement faces the problem of arranging for local service or support for foreign-purchased commodities. For many items, having a local agent is essential for installation, staff training, after sales servicing and spare parts availability or access.
- It is premature to judge the performance of the PSA. However, the experience to date with PSA selection and procurement leads one to the conclusion that the system is not working as planned. The GSL, because of its own regulations and unfamiliarity with the use of procurement agents, insists on reviewing and/or duplicating all PSA actions and recommendations, thus negating a large share of the rationale for using a PSA in the first place.
- There are several small outstanding problems relative to the financial instrument used to effect commodity procurement in some cases that needs to be resolved. One of these has to do with the use of AID direct Letters of Commitment (L/Com) rather than bank Letters of Credit (L/C) for payment to suppliers in third countries (e.g., Japan). The DOA is most familiar and comfortable with the latter procedure, and has encountered some reluctance on the part of overseas principals to accept AID L/Coms. Further, the DOA financial office feels that under the L/Com procedure, it has no representative in the country of commodity origin to protect its interests comparable to the role played by the corresponding bank under the L/C procedure.
- The DOA's Chief Accountant has questioned the delay being encountered between the time an order is placed and an expenditure is accrued, and the time that he is advised that the disbursement has been made so that he may make the proper notation in his records and confirm the expenditure. Some of this delay may result from AID procedures that it may be possible to streamline.

- Given the delays and problems to date, the consensus seem to be that there isn't much potential for further streamlining of commodity procurement procedures. The PSA contract is finally in place, "informal competition" has been authorized (which facilitate the PSA's work), USAID and DOA personnel are in close and regular contact regarding commodities issues ("a mutual learning process"), and the T.A. team is providing useful input into the determination of equipment needs and specifications. The Superintending Engineer for Research and Development, who has primary responsibility for DOA equipment procurement (i.e., preparation of equipment specifications and tender documents, evaluations of bids) will be attending the AAPC commodity procurement course in the U.S. this October.
- Commodity procurement appears to be overbudgeted. Due to the slowness in effecting procurement, it is unlikely that the full PP amount will be utilized as initially planned.

#### Recommendations

1. Procurement through the PSA mechanism should be reduced to the absolute minimum, and, instead, maximum reliance should be placed on local host country procurement, both in the interests of timeliness and increased assurance of local maintenance and support.
2. Efforts should be made to assure that adequate scientific equipment is available at selected RRCs to meet the reasonable needs of participants returning to undertake their thesis research; i.e., that in providing equipment for the RRCs the timing and nature of students' research requirements also be kept in mind.
3. Procurement of seed processing equipment should be deferred pending decisions regarding the proposed restructuring of the seed industry and the relative role and needs of the Seeds Division under such a restructuring. While it would be good if the long-term seed specialist could be in-country for the receipt and installation of the equipment, and the training of operators, this could also be handled by one or more short-term assignments. It is, however, essential that the long-term seed specialist be actively involved in determining equipment needs and specifications regardless of the restructuring decisions.

4. The USAID Project Officer and Controller should get together with the DOA's Chief Accountant as soon as possible and attempt to address the concerns voiced over the use of financial instruments and delays in payment.
5. Limited commodity support should be provided to the PGIA to upgrade its research support and supervision capability, using the commodity funds which now appear to be in excess. Priority needs are for additional computer facilities, and vehicles to facilitate field supervision of research.

### 3. GSL Budget Support

The GSL financial contribution to DARP as of June 30, 1987, is shown in Appendix XV. The total to date comes to Rs 12.5 million, or approximately \$416,000. This includes some costs (e.g., taxes and duties on commodities) which AID does not consider as bona fide host country contributions. On the other hand, other costs incurred by the DOA (e.g., commodity warehousing, inventory, inland transport) are not included. An explanation of the various GSL expenditure items follows.

**Technical Assistance:** \$16,400 rupees equivalent has been expended, vs. the pp projection of \$75,350. The reduced TA level is one explanatory factor. Delays in fielding TA (relative to the PP schedule) are another. All GSL expenses are by apportionment. GSL is also using a lower figure (\$200/p.m.) than in the PP budget (total of \$520/p.m.)

**Training:** No expenditure is recorded as accrued, due primarily to delays in start up of training. Rs.50,000 has been earmarked in '87 for tuition and fees at the PGIA, which accords with the PP figure. However, the PP appears to have underbudgeted for this item, as there is no provision for in-country travel, per diem and subsistence allowance. A more realistic figure, assuming continuation of the split training program would be an additional Rs 500/student/month while registered at PGIA, or a total of Rs 122,000 per year (assuming roughly 144 person months of support. The DOA has tentatively agreed to provide this support, which will have to be found within the allocations of the students' respective divisions through December, 1987. Beginning in 1988 the DOA should earmark funds for such in-country participant training costs in the training line item of the budget.

**Commodities:** The PP budget, exclusive of taxes and duties, was \$32,000\*, for clearance, inland transport, storage and inventory. Recorded DOA expenditure to date is approximately \$160,000. However, the bulk of this consists of duties and taxes. Actual (apportioned) costs have not not determined. The GSL is making adequate budget provision for planned procurement.

**Facilities:** The GSL is making adequate budgetary provisions. Actual expenditure is lagging behind PP projections.

**Personnel:** This includes incremental personnel plus apportionment of present staff. The basis for the apportionment appears valid. Approval and recruitment of incremental personnel (primarily ROs & RAs) is behind the PP schedule. Expenditure is lagging well behind PP projections, with only \$150,000 thru 6/87 vs. PP projections of \$457,000.

**Operations & Maintenance:** Includes O&M on new facilities and equipment plus apportionment of existing stock. Expenditure is lagging behind PP projections, with only \$55,000 expended to date vs. projection of \$175,000. This appears to be primarily the result of delays in construction and commodity procurement components.

In looking at overall DOA resource allocation for research and extension, one sees a steadily increasing allocation of funds for recurrent costs, all of which is from the GSL consolidated budget and therefore best represents actual GSL funding commitment. These figures, for 1983-1987, are as follows:

	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
Crop Research	31.0	28.0	36.4	48.7	51.0
Crop Production & Extension	55.7	59.2	64.1	68.6	74.9

(1986 and 1987 are estimates. The others are actual expenditures.)

Recurrent expenditure for DARP was first carried as a separate line item in the 1986 budget estimates at Rs. 6.0 million. In the 1987 estimates this was increased to Rs. 6.5 million. For 1988, the DOA's budget request specifically for DARP totals Rs 50.5 million, of which Rs 44.3 million is capital and Rs 6.2 million recurrent expenditure. The capital budget is further broken down as follows:

- Direct Foreign Assistance (e.g., direct AID L/Coms)	Rs. 21.8 million
- Reimbursable Foreign Assistance (e.g., FAR)	13.5 "
- GSL Consolidated Budget	9.0 "
	Rs. <u>44.3 million</u>

#### In Summary

The DOA does appear to be committed to increasing its overall funding allocation for agricultural research and extension, and to meeting its commitments to DARP, although expenditures for the latter are lagging behind projections. Due to the lack of any system for program budgeting in the DOA it is impossible to determine what portion of the overall research and extension allocations go for other field crops that are of interest for agricultural diversification. The DOA, with assistance from the IBRD-funded Agriculture Research Project, plans to initiate program budgeting on a pilot basis in 1988.

### Recommendations

1. Program budgeting in the DOA is a sorely needed development, which DARP should make every effort to encourage and support.
  2. The DOA will need to make additional budget allocations for the in-country training costs of students at the PGIA as noted above. Steps are also needed to complete recruitment to new positions authorized for DARP, and to obtain authorization for the balance positions or arrange for reallocation of existing staff to meet specific requirements of DARP (especially in the Research Officer, Economics Officer, Research Assistant and Economics Assistant categories.)
4. Other Donor Coordination

### Findings/Conclusions

Other donor coordination under DARP appears to be largely ad hoc, but effective. USAID, DAI and DOA personnel deal with other donor activities as and when needed. The main areas of collaboration have been with the Netherlands Government on seed-related issues and the UNDP/FAO Fertilizer, Pesticide Registration and Horticulture Projects. (See Appendix XX for a complete list of other donor contacts/collaboration from DAI's 1986-87 Annual Report.)

The Netherlands Government has, since 1977, been the principal donor in the Sri Lankan seed sector, funding seed potato and vegetable seed projects and the establishment of a national Seed Certification Service (SCS). The Netherlands Government, with DARP, co-funded the 1987 Sri Lanka Seed Workshop, and is contributing approximately 25% of the costs of the Feasibility Study on the Restructuring of the Sri Lankan Seed Program. The UNDP/FOA projects are officed directly adjacent to the DAI office, the subjects are directly relevant to DARP, and coordination is frequent and effective.

Through their own efforts, and those of USAID, DARP and the DAI team are closely involved with the overall Mahaweli development program as it pertains to agricultural diversification. Also USAID and DARP were consulted in the design of the World Bank-funded ARP, and USAID and the Bank are endeavoring to pursue a common policy for participant training and to coordinate construction and commodity procurement activities planned under the two projects. USAID and DARP also assisted the Asian Development Bank in developing a project in agriculture diversification (focusing on tree crops).

In summary, donor coordination relative to agricultural diversification appears to be effective. USAID and the DAI teams are aware of relevant other donor activities, and have been in consultation and/or collaboration with them. It is accurate to say that DARP has served as a catalyst for a wide range of other donor and GSL activity in the area of agricultural diversification.

## 5. Central Project Buy-ins

### Findings/Conclusions

Taking note of the areas of congruence between DARP and several centrally-funded projects, explicit provision was made in the PP for "buy-ins" or cost sharing with such projects (e.g., certain of the CRSPs, Small Farmer Market Access, NIFTAL, INTSOY) in order to obtain access to their technical assistance, networking and training possibilities. Approximately \$200,000 in grant funds was set aside for this in the budget. However, the implementation record to date for this has not been good--major delays have been encountered, centrally funded project personnel have by-passed the Mission in dealing with host country personnel and institutions, the Mission has not been kept up to date on the status of centrally-funded projects, guidance regarding mechanism(s) for buy-ins has been incomplete and, in general, the time and energy devoted to this in the Mission have not begun to bear corresponding results. At the same time, the potential for positive collaboration is still acknowledged, and interest remains in making use of, inter alia, the NIFTAL, Communications for Technology Transfer in Agriculture (CTTA), and Agricultural Marketing Improvement Strategies (AMIS) Projects.

### Recommendation

It is incumbent upon AID/W to provide missions with the information, guidance and support needed to effectively make use of the resources available through centrally-funded projects. Missions should be provided with regularly updated inventories of centrally-funded project resources available, along with detailed, step-by-step procedures, cleared by the contracts office, on means of tapping these resources.

## H. Project Design Considerations

As referred to in other sections, there have been problems in certain project components, i.e., long-term training, construction, procurement and management. We think some are being resolved, i.e., construction and procurement, and we have suggested some actions that may help resolve others. We think a retrospective look at the problems may be useful in better understanding why they occurred.

We believe that one source of difficulty was that of over-optimistic time frames and, in some cases, pushing the timing too hard. In the long-term training, for example, some students were sent out for academic studies before important decisions regarding their total programs were made and agreed upon. The program is now reaping some bitter fruit as a result.

Scheduling of long-term TA was, in some cases, also premature in our view. Some of the DOA personnel who would have benefited most from the long-term TA are now on study leave, and many will not return until the TA team is gone. Aside from the COP and the seeds specialist, it might have been more productive to have delayed other long-term staff until nearer the end of the DAI contract rather than near the beginning. Perhaps the old adage "haste makes waste" may still have a lesson for project designers and project officers.

In general, we think that priorities within each project component remain consistent with priorities relating to agricultural diversification in the National Food, Agriculture and Nutrition Strategy. As indicated in the discussion of logframe assumptions, the one priority that was not adequately recognized was the need for attention to marketing of SFC. It is still possible to make a good start in considering and responding to needs of the marketplace during the life of the project.

We think the DARP is in a unique position to promote collaboration and cooperation among DOA divisions, and between the DOA and other organizations and, at the same time, to generate enthusiasm and support for agricultural diversification. Through judicious use of a modest, competitive "special projects fund", established in the DOA budget with DARP grant funding, we think a great deal of targeted research, and some innovative pilot projects in extension, training and seeds could be generated. The competition would be open to any Sri Lankan professional, either inside or outside the DOA, for proposed activities supportive of the objectives of the DARP. By this means the talents, not only of DOA personnel, but that from universities, other government organizations and even from the private sector could be brought to bear on the constraints to agricultural diversification. Grants would be awarded by the PMC on a competitive basis based upon reviews and recommendations by a sub-committee of experts appointed by the PMC. The PMC would, subject to USAID and DOA approval, establish limits for the grants and the rules under which the program would operate.

An adjunct to the grants program could be an awards program that would recognize, in a tangible way, outstanding accomplishments in work relating to DARP objectives by DOA personnel. Perhaps up to four or five awards could be made annually based on nominations by either peers or supervisors.

V. RECOMMENDATIONS

IV-A. Research and Extension

Research

1. A strongly applications-oriented FSR/E consultant (not a theorist but a practitioner) should be provided under DARP funds for at least three months at an appropriate time to assist in developing some practical "next steps" in the farming systems component. Next steps should, we think, be the designing and implementation of two or three pilot FSR/E activities.
2. A small discretionary fund should be set aside in the DAI contract budget to be managed by the COP with the USAID Project Officer's concurrence, to be used to cover such operating costs in research. A reasonable limit on individual purchases agreeable to the COP and AID would have to be negotiated.
3. Consideration should also be given to funding pilot or demonstration activities of the DOA relative to DARP with grant funds through the DOA budget. We understand that the DOA has limited authority to create additional budget line items using donor grant funds. This could be useful in initiating such activities as seed research, breeder and foundation seed units, or a small grant program to cover the research costs for DARP-related research that would be open to both DOA and non-DOA researchers. This would then create a precedent and process for continued funding using GSL consolidated budget resources.

Extension

1. The DOA needs to formulate an integrated plan for extension for the SFCs. The plan should include emphasis on marketing, and the quality requirements for the various market options, as a precondition to a major production push. The Haws completion-of-assignment report may serve as a point of departure for preparing such a plan. Sufficient marketing experience and insight exists within the Economics and Extension Divisions to address the marketing elements of such a program if it can be brought to bear.
2. DARP should, based on the DOA's proposal(s), make available additional technical assistance (long- or short-term) in carrying out such a program.

#### IV-B. Seeds Program

1. AID and the GSL should follow the Study Team's recommendations with respect to equipment acquisition, i.e., importation of smaller and/or portable seed processing equipment.
2. Provision should be made for improved office and laboratory work space, and for equipment and conditioned storage at the three or four locations where breeder and foundation seed would be handled-- i.e., for the proposed "Varietal Maintenance Units" and the Seed Division's foundation seed program.
3. USAID should maintain flexibility through DARP to provide at least one additional year of technical assistance by the seed specialist should the GSL decide to move ahead with most, if not all, of the basic restructuring recommended by the Study Team. We believe such assistance should be accorded high priority in the programming of DARP resources.
4. USAID should be prepared to support the use of other, non-DARP resources (e.g., PL 480 local currency generations), to support a logical program for development of a private seed industry.
5. As noted in the above section on research, discretionary funds should be made available in limited amounts for use by the DAI team for work relative to SFC seeds. Also, DARP grant funds should be channeled through the DOA budget to support pilot efforts related to improvement of the seed industry.

#### IV-C. Social and Economic Studies

##### Overview

1. The capacity and role of the DAEP should be significantly upgraded, with the DAEP taking on an increasing analytical and advocacy role regarding SFC-related program and policy decisions. Steps should be taken to further ease the routine data collection and compilation burden on the DAEP, freeing up resources for more important analytical work. (e.g., the adoption of an area frame sampling methodology would simultaneously reduce the workload and collection cost, and improve the quality of basic agricultural data.)
2. The MADR needs to move quickly and effectively to bring about improved coordination of domestic SFC procurement and imports, and to promote expanded exports.

3. DARP social and economic research funding needs to be made available for increased marketing research, either through the Social Science Review Subcommittee or through the DAEP's budget.
4. Research and extension both need to devote more attention, at least initially, to cost minimizing rather than yield maximizing technologies, with the objective of achieving significant reductions (below world market prices) in SFC production costs.

#### Social Science Review Committee

Immediate steps should be taken to energize the Social Science Review Sub-Committee and step up its activities, including initiation of the small grants program. While the main socio-economic problems relative to agricultural diversification appear to lie in the area of marketing and price policy, much work is needed on such topics as the interrelationship of land tenure, scale of operations, labor availability and distribution and credit on farmers' production and marketing decisions, and on farmers' perceptions leading to resource allocation and marketing decisions.

#### Baseline Survey

Due to the time and resource requirements, an update of the full baseline survey, employing the same sample frame, should be undertaken only once more during the LOP, to provide input for the end-of-project evaluation. Resources should be provided (if not already undertaken) so that the DAEP can undertake the entire update 'in-house', so as to facilitate processing and analysis and further develop DAEP capabilities.

#### IV-D. Participant Training

1. Continue with the split degree programs for master's degree candidates. For PhD candidates, the need for the highest possible quality combined with timely completion argue in favor of a U.S. degree program, with research carried out in Sri Lanka. For the balance long-term participants, more careful review of study and research plans is essential in order to assure that facilities and supervision are available in Sri Lanka. Where this is not the case, and the training is high priority for the DOA, waivers of the split degree policy should be granted. (It should be noted that the unequivocal commitment of the DOA to the split degree program is essential if it is to be implemented at all, much less be regarded as successful.)

2. For the balance students under a split degree program:

(a) Move quickly to address legitimate grievances (subsistence, travel, per diem, timely appointment of committees) and improve coordination between the PGIA and DOA for the conduct of research.

(b) Explore the possibility of joint degree programs with U.S. universities. This should mitigate some of the students' complaints regarding the value of their education and the quality of research supervision. This may require limited additional funding for a U.S. committee member to participate in research design and supervision, but the result should be worth the expense.

(c) Arrange for U.S. universities to provide participants with certificates recognizing their successful completion of a program of graduate course work.

IV-E. Management and Coordination

1. A series of workshops, perhaps jointly funded by DARP and the World Bank-funded Agricultural Research Project (ARP), dealing with management information systems, and program planning and budgeting would be helpful. These could be scaled to manageable segments, e.g., research, where commonalities might be conducive to more productive exchanges.
2. A short-term consultant, funded through DARP, specializing in information management in technical organizations, i.e., research, extension, education and training, should be provided to make an assessment of information management processes and problems in the DOA. A modest investment in such assistance could pay large dividends by helping to assure that information processes accommodate the needs of management and operations at all levels.
3. A set of more generalized management training activities should be initiated to sharpen skills, particularly at the middle management level. A number of firms and institutions have had extensive experience in this area. If not available in Sri Lanka, it is possible that such talent may be available elsewhere in South or Southeast Asia.
4. DARP should promote and support innovative management steps within the DOA, e.g., in providing recognition and, possibly, cash awards for research or other work determined to be particularly significant by a panel of peers or superiors.

#### IV-F. Technical Assistance Contractor Performance

1. Extend the COP for at least one year or (better) eighteen months. We believe that withdrawal of the COP in eleven months would place the program at considerable risk. His presence is needed to continue to properly manage and coordinate TA and training activities and provide overall management input.
2. The services of the agronomist for an additional year would permit overlap with key trainees as they return to duty in DOA research, and would facilitate institutionalization of the improved research activities and procedures initiated.
3. Much of the soil and water management work initiated under DARP can and should be continued through the new Mahaweli Agriculture and Rural Development (MARD) Project, provided there is not a major delay in arrival of that TA team. This can be supplemented with some short-term TA in the interim.
4. Should the GSL elect to follow the direction suggested by the Seed Feasibility Study Team, extending the seed specialist for an additional year would be essential. In any event, either long- or short-term assistance will be needed when the new seed processing equipment is installed and tested, and personnel trained in its use.
5. Provide a legume breeder in early 1988 for an eighteen month assignment.
6. Make available an additional 60 pm of short-term TA. Several needs have been identified in this report, and others will undoubtedly surface over the remaining life of the project.
7. Exercise the option in Section H.3 of the DAI contract. Meet any further TA needs through direct means, e.g., PSCs.

#### IV-G. Other Project Components

##### Construction

1. No changes are necessary in procedures, other than closer coordination and more timely action on the part of the DOA to determine and finalize requirements, sites and designs.
2. The construction programs under DARP and ARP need to be closely coordinated among all three parties (USAID, DOA & Bank).
3. In view of the possibility of significant change in the role of the DOA Seeds Division under an industry restructuring program, USAID and the DOA may wish to reconsider certain seed processing facilities not already too far along in the contracting process, to assure that the overall program is enhanced by the facilities upgrading.

### Commodity Procurement

1. Procurement through the PSA mechanism should be reduced to the absolute minimum, and, instead, maximum reliance should be placed on local host country procurement, both in the interests of timeliness and increased assurance of local maintenance and support.
2. Efforts should be made to assure that adequate scientific equipment is available at selected RRCs to meet the reasonable needs of participants returning to undertake their thesis research; i.e., that in providing equipment for the RRCs the timing and nature of students' research requirements also be kept in mind.
3. Procurement of seed processing equipment should be deferred pending decisions regarding the proposed restructuring of the seed industry and the relative role and needs of the Seeds Division under such a restructuring. While it would be good if the long-term seed specialist could be in-country for the receipt and installation of the equipment, and the training of operators, this could also be handled by one or more short-term assignments. It is, however, essential that the long-term seed specialist be actively involved in determining equipment needs and specifications regardless of the restructuring decisions.
4. The USAID Project Officer and Controller should get together with the DOA's Chief Accountant as soon as possible and attempt to address the concerns voiced over the use of financial instruments and delays in payment.
5. Limited commodity support should be provided to the PGIA to upgrade its research support and supervision capability, using the commodity funds which now appear to be in excess. Priority needs are for additional computer facilities, and vehicles to facilitate field supervision of research.

### GSL Budget Support

1. Program budgeting in the DOA is a sorely needed development, which DARP should make every effort to encourage and support.
2. The DOA will need to make additional budget allocations for the in-country training costs of students at the PGIA as noted above. Steps are also needed to complete recruitment to new positions authorized for DARP, and to obtain authorization for the balance positions or arrange for reallocation of existing staff to meet specific requirements of DARP (especially in the Research Officer, Economics Officer, Research Assistant and Economics Assistant categories.)

### Central Project By-ins

It is incumbent upon AID/W to provide missions with the information, guidance and support need to effectively make use of the resources available through the centrally-funded projects. Missions should be provided with regularly updated inventories of centrally-funded project resources available, along with detailed, step-by-step procedures, cleared by the contracts office, on means of tapping these resources.

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# APPENDIX I

## PROJECT DESIGN SUMMARY LOGICAL FRAMEWORK

Life of Project:  
From FY 84 through FY 89  
Total U.S. Funding \$11,300,000  
Date Prepared: May 7, 1984

Project Title & Number: Diversified Agriculture Research, 303-0068

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS																																																								
<p><b>Program or Sector Goal:</b></p> <p>Increased small farmer income and employment in the dry and intermediate zones, and improved nutrition</p>	<p><b>Measures of Goal Achievement:</b></p> <ol style="list-style-type: none"> <li>1. Gross and per acre production of SFC increasing;</li> <li>2. Returns to labor in SFC production increasing;</li> <li>3. Income of dry and intermediate zone farmers increasing; and,</li> <li>4. Increased availability of target crops at affordable prices, for all income groups.</li> </ol>	<ol style="list-style-type: none"> <li>1. Department of Agriculture (DOA) survey findings,</li> <li>2. Census and Statistics data; and</li> <li>3. Agro-socio-economic studies</li> </ol>	<p>Assumptions for achieving goal/targets:</p> <ol style="list-style-type: none"> <li>1. Continued political stability and economic growth;</li> <li>2. Normal weather patterns, and</li> <li>3. Economics of SFC production remain positive.</li> </ol>																																																								
<p><b>Project Purpose</b></p> <p>To strengthen the institutional capability to generate and effectively transfer technologies and skills required to increase and sustain SFC production on small farms</p>	<p>Conditions that will indicate purpose has been achieved:</p> <p>End of project status</p> <ol style="list-style-type: none"> <li>1. Improved SFC varieties and production practices, appropriate to regionally differentiated farming conditions, being identified and disseminated to farmers;</li> <li>2. Research strategies and priorities being set on the basis of farmer and market needs;</li> <li>3. 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;</li> <li>4. Increased understanding of SFC cropping patterns and of social and economic factors affecting production reflected in DOA decision making; and,</li> <li>5. Integrated intra-divisional management system for SFC-related activities in operation.</li> </ol>	<p>Project evaluation,</p> <ol style="list-style-type: none"> <li>1. Project records, including Dept.</li> <li>2. Site visits;</li> <li>3. DOA program; and</li> <li>4. Project-funded and other studies.</li> </ol>	<p>Assumptions for achieving purpose:</p> <ol style="list-style-type: none"> <li>1. DOA able to recruit and retain quality personnel;</li> <li>2. GSL maintains priority on SFC.</li> </ol>																																																								
<p><b>Outputs</b></p> <ol style="list-style-type: none"> <li>1. Increased number of better trained personnel engaged in SFC agro-socio-economic research, extension, and improved seed systems;</li> <li>2. Improved physical facilities (seed storage and handling, laboratories, green houses, nurseries) at research stations and seed farms;</li> <li>3. Effective linkage between research, improved seed, extension and training for SFC;</li> <li>4. Studies of socio-economic status, crop area;</li> <li>5. Improved linkages in place within Department of Agriculture, International Research Institutes, and other national agricultural research/seed centers;</li> <li>6. Improved seed production, processing and distribution system in operation;</li> <li>7. Increased numbers of high yielding varieties of SFC;</li> <li>8. Increased and broadened year-round collection of SFC; and,</li> <li>9. Increased knowledge of SFC cropping patterns.</li> </ol>	<p><b>Magnitude of Outputs:</b></p> <ol style="list-style-type: none"> <li>1. Sixty-one advanced degree, 55 pm of short-term training;</li> <li>2. Seven regional research farms and 4 seed farms and one seed processing center with upgraded physical facilities and equipment;</li> <li>3. Increased extension input into research programming, improved design and implementation of on-farm trials, improved training of extension staff, especially SMS and SFC;</li> <li>4. 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;</li> <li>5. Regular exchange of information among personnel through programmed training, visits and workshops;</li> <li>6. Improved seed quality; reduction of losses, adverse and timely sowing;</li> <li>7. Systematic release of improved SFC varieties tailored to specific agro-climatic conditions;</li> <li>8. Regularized introduction of potentially valuable germplasm being utilized and maintained; and,</li> <li>9. Development and extension of cropping systems with appropriate SFC components.</li> </ol>	<p><b>Means of Verification</b></p> <ol style="list-style-type: none"> <li>1. DOA records,</li> <li>2. Project evaluations;</li> <li>3. Site visits;</li> <li>4. Project audit; and</li> <li>5. Agro-socio economic studies.</li> </ol>	<p>Assumptions for achieving outputs:</p> <ol style="list-style-type: none"> <li>1. Timing and quality of inputs to specifications; and</li> <li>2. AEARP and SCS projects proceed as planned.</li> </ol>																																																								
	<p><b>Quantity (1990)</b></p> <table border="1"> <thead> <tr> <th></th> <th>AIS</th> <th>GSL</th> <th>TOTAL</th> </tr> </thead> <tbody> <tr> <td>STAFF</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Technical Assistance</td> <td>3,215.4</td> <td>121.6</td> <td>3,337.0</td> </tr> <tr> <td>Training</td> <td>1,884.4</td> <td>11.0</td> <td>1,895.4</td> </tr> <tr> <td>Statistics</td> <td>-</td> <td>23.8</td> <td>23.8</td> </tr> <tr> <td>Extension</td> <td>-</td> <td>231.7</td> <td>231.7</td> </tr> <tr> <td>DOA Staff</td> <td>-</td> <td>1,338.9</td> <td>1,338.9</td> </tr> <tr> <td>Extension &amp; Maintenance</td> <td>-</td> <td>1,177.6</td> <td>1,177.6</td> </tr> <tr> <td>Production</td> <td>123.0</td> <td>6.9</td> <td>131.9</td> </tr> <tr> <td>Division of Economic Research</td> <td>200.0</td> <td>-</td> <td>200.0</td> </tr> <tr> <td>Division Project Cost-sharing</td> <td>146.0</td> <td>-</td> <td>146.0</td> </tr> <tr> <td>Management</td> <td>133.9</td> <td>18.4</td> <td>152.3</td> </tr> <tr> <td>Unfilled</td> <td>1,754.1</td> <td>257.0</td> <td>2,011.1</td> </tr> <tr> <td>GRAND TOTAL COSTS</td> <td>2,222.0</td> <td>2,189.0</td> <td>4,411.0</td> </tr> </tbody> </table>		AIS	GSL	TOTAL	STAFF				Technical Assistance	3,215.4	121.6	3,337.0	Training	1,884.4	11.0	1,895.4	Statistics	-	23.8	23.8	Extension	-	231.7	231.7	DOA Staff	-	1,338.9	1,338.9	Extension & Maintenance	-	1,177.6	1,177.6	Production	123.0	6.9	131.9	Division of Economic Research	200.0	-	200.0	Division Project Cost-sharing	146.0	-	146.0	Management	133.9	18.4	152.3	Unfilled	1,754.1	257.0	2,011.1	GRAND TOTAL COSTS	2,222.0	2,189.0	4,411.0	<p><b>Means:</b></p> <ol style="list-style-type: none"> <li>1. Department of Agriculture Budget;</li> <li>2. Project records and reports; and</li> <li>3. Project evaluations and audits.</li> </ol>	<p><b>Assumptions:</b></p> <ol style="list-style-type: none"> <li>1. AID &amp; GSL policies and priorities unchanged; and</li> <li>2. Budgets forthcoming as planned.</li> </ol>
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## EVALUATION SCOPE OF WORK

I. Activity to Be Evaluated:

Title: Diversified Agriculture Research Project (383-0058)  
LOP Funding: \$ 11.4 million  
Date Project Authorized: 8/9/84  
PACD: 8/31/92

II. Purpose of Evaluation:

This will be the first interim evaluation of the project. The primary purpose is to provide USAID/Sri Lanka and the Department of Agriculture with an assessment of project implementation and progress to date and to recommend any modifications to improve the likelihood of achieving the project purpose. The evaluators will assess the delivery of AIB and USA project inputs, progress towards achieving the Life of Project LOP Implementation Plan, progress toward achieving the project purpose, the performance of the Technical Assistance contractor, and the validity of initial design assumptions and strategies.

III. Project Background and Summary 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, downward pressure on 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 virtually non-existent, 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 declining nutritional status and inefficient land and water use, is moving from a policy of rice self-sufficiency towards one of agricultural diversification, with special emphasis on subsidiary field crops (SFC) 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 this project is to strengthen the capability of the Department of Agriculture (DOA) 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 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. This institution-building effort 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 an effort to improve the effectiveness and impact of research, the project will seek to institutionalize the use of multidisciplinary 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 lands 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, improved extension, improved seed production and distribution, and strengthened project-specific and overall DOA management capability. The project will provide assistance to seven Regional Research Centers (RRC) and In-Service Training Institutes, five Seed Processing Centers, four Seed Farms, and to DOA headquarters in Peradeniya. Major project inputs (AID and GSL) include technical assistance; long- and short-term training, some of which will be provided in-country at the Postgraduate Institute of Agriculture; construction and renovation of facilities (laboratories, seed processing and storage facilities, staff quarters); commodities (laboratory, farm equipment); new staff; operating budget; and funds for evaluation, several project workshops, AID/W central project cost sharing, and economic and social research.

By the end of eight years, this integrated program in subsidiary field crops (SFC) 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 and opportunities; (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 inter-divisional management system for SFC-related activities.

The specific outputs to be achieved under the project are:

- (a) an increased number of better trained GSL personnel engaged in SFC agro-socio-economic research, extension, and improved seed production, processing and distribution.
- (b) improved physical facilities (seed storage and handling, laboratories, greenhouses, etc) at seven regional research farms, four seed farms, and five seed processing centers;

- (c) effective linkages established for SFC among research, extension, training, and improved seed operations by increased extension input into research programming, improved design and implementation of on-farm trials, a better-trained extension staff, closer plant breeder-seed production linkages;
- (d) social and economic research program of the Division of Economics and Projects upgraded including monitoring of SFC production and marketing variables on a long-term basis, a number of analyses based on these studies completed and increased multi-disciplinary work involving physical, biological, and social sciences underway involving both DOA and outside personnel;
- (e) improved linkages in place between the DOA, International Research Institutes, and other national agriculture research centers, with regular exchange of information among personnel through programmed training, visits and workshops;
- (f) improved SFC seed production, processing and distribution system in operation which assures better seed quality, reduction of losses, and a timely and adequate supply, with a limitation of the public sector's role in SFC seed production to maintenance/production of breeder, foundation and registered classes of seed, and an expansion of the private sector's role;
- (g) high yielding improved varieties of SFC, tailored to specific agro-climatic conditions, developed and systematically released to farmers;
- (h) increased and broadened SFC germplasm collection and the regularized introduction of potentially valuable germplasm to research farms in a manner that assures proper use and maintenance; and
- (i) increased knowledge of SFC cropping patterns.

Technical, advisory, administrative, management, training and other relevant services as required to achieve the project objectives will be provided by the selected contractor (Development Alternatives Inc.).

The long and short term training will be undertaken in accordance with Life-of-Project and annual training plans prepared by the Project Management Unit (PMU) with contractor assistance. The long-term training will take place in the U.S., Sri Lanka, and 3rd countries, especially those in Asia. Short-term training will also be undertaken in these countries, with particular emphasis on the International Research Centers (e.g. ICRISAT, IRRI).

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Commodities will be procured directly by the DOA, either acting on its own behalf, or through a U.S procurement service agent (PSA) for most off-shore procurement.

Construction will be managed by the MADR/DOA, which will contract with a competitively selected local architect/engineering (A/E) firm. The A/E firm will complete all plans, specifications and cost estimates and supervise construction/renovation activities carried out by local construction firms, which will also be competitively selected. The construction element of the project will be monitored by the Civil Engineering Division of the DOA, reporting to the PMU.

Annual project reviews will be held each March/April, and will involve the MADR, DOA, the TA/training contractor and USAID. These reviews will assess implementation progress and problems, develop the technical work plan and training plan for the crop year and academic year beginning each September/October, and provide input for the GSL's project budget formulation for the following calendar year.

Seminars and workshops, such as an implementation workshop and farming systems research workshop, will be developed by the DOA and the TA/Training contractor; all associated dollar costs, and a share of the local costs, if necessary, will be directly financed by AID under the grant.

Social and Economic Studies will be designed and monitored by a social science review sub-committee established by the Project Co-ordinating Committee (PCC). The studies will be implemented by local DOA contracts, which will be reviewed and approved by USAID.

Funding is also provided under the project for utilization of AID/washington-managed projects for certain short-term IA and training programs. Use of these project will be reviewed and plans for the following year formulated in the course of each annual review.

iii. Statement of work:

The evaluation team will prepare an evaluation report which addresses the following major issues and specific questions:

(1) What progress has been made in establishing a useful research program for SFCs?

- Has the L.O.P. workplan been accepted by the D.O.A. as a D.O.A. workplan for the subsidiary field crops?
- Have the project research priorities been logically formulated? Is there indication that the crops on which priority is placed have reasonable market potential (domestic or international) and profit potential for farmers.
- Has the project taken a logical approach to Farming Systems Research in the Sri Lankan context?
- What progress has been made towards defining and undertaking the socio-economic studies?
- Has the DOA budget and resources shifted enough to adequately support SFC research? Are adequate recurrent costs being provided to conduct effective on-farm trials, demonstrations and other extension efforts?
- Examine the linkages between the D.O.A. Research, Extension and Training Divisions; Universities; farmers; and make recommendations on how the flow of information may be accelerated or improved.
- Will data being gathered in the baseline survey or other socio-economic studies yield information on both men's and women's roles in SFC production and marketing?
- Has the project taken steps to build linkages with International Agriculture Centers and other National Research/Seed Centers?

(2) What progress is being made toward upgrading SFC seed production and marketing? Are changes needed in this component?

- Assess the progress towards privatization of the seed industry and evaluate the prospects for success.
- Is there an inconsistency between the planned project output of increased privatization of the seed industry and the project investment in Department of Agriculture seeds facilities and equipment?
- Does the project coordinate with other donors?

(3) Assess the progress of the training component to date.

What training has been conducted to date? Is the selection of trainees and training programs contributing to achieving the project purpose?

- Is the split training program appropriate? What improvements could be made to this program to make it more productive and also acceptable to the DOA, PGIA and the participants?
- Have the project workshops been effective in achieving their objectives?
- Has the project developed a useful approach for the development of research management training?
- Are procedures for selecting participants effective in identifying the most appropriate candidate?

(4) Is satisfactory progress being made on accomplishing other project outputs? What are the prospects of the project achieving the project purpose and End-of-Project Status (EOPS)?

- Is input delivery on schedule? Is progress towards achievement of the other planned outputs of the L.O.P. workplan satisfactory? (eg. construction at research centers.)
- What progress has been made towards implementation of a DOA mass media campaign for SFCs?
- Has the GSL provided in a timely manner, sufficient Department of Agriculture (DOA) support staff to implement the project?
- Has GSL counterpart funding been adequate to achieve project purpose? Is adequate counterpart funding provided to other project elements?

(5) Does the project have a satisfactory system in place for monitoring project implementation, achievement of outputs, and purpose level indicators?

- What has been the progress in conducting and analyzing the baseline survey? What have been the nature of the delays?
- When analyzed, will the baseline survey provide a useful measurement of changes in SFC production and farming practices?
- Will the baseline survey be a useful instrument for measuring project implementation? for measuring progress towards achieving the project goal and purpose? If not, what other measures would be useful for this?

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(6) Has the role, performance, and deployment of the Technical Assistance Contractors been satisfactory?

Does the project management system function effectively? Has the DAI TA team effectively contributed to achieving the project purpose? Has DAI been responsive to the project needs of the Department of Agriculture?

- Are the number of person months of service budgeted in the DAI Contract for the long term Agronomist and the long term Soil/Water Management Specialist adequate to achieve the project purpose? Is there need for further long term technical assistance in other specific fields?
- Evaluate the efficacy of the RDC subcontract (for architecture and engineering services) under the DAI contract.
- Evaluate the performance of DAI and IIE in implementing the participant training component of the project.
- Can the communication and linkages among the DGA, DAI TA Team, and USAID be further improved?

(7) Is the basic design of the project still valid? Are design modifications recommended?

- Do the assumptions in the logframe or other parts of the project design still remain justified?
- Do the priorities within each of the project components remain consistent with national priorities established in the National Food, Agriculture, and Nutrition Strategy? Based on the experience with this project, are there any ways in which either project priorities or national strategic priorities should be reconsidered?
- What are the major implementation problems? How are they being addressed? Are the measures taken appropriate?
- Has the Department of Agriculture improved its linkages and co-ordination with the PGIA, other Universities, Mahaweli Economic Authority and the Irrigation Department?

In any of the above areas, or others identified by the evaluation team, special attention should be focused on identifying any aspects of the project where implementation is substantially behind schedule and on suggesting practical means overcoming implementation problems.

In the evaluation report, the evaluation team will distinguish clearly among their findings (i.e., the evidence), their conclusions (i.e., interpretations and judgements about the findings), and their recommendations. Clearly indicate the agency or office responsible for implementing recommendations.

#### IV. Methods and Procedures

A. In conducting the evaluation, the evaluators will:

- (1) review all relevant project documents;
- (2) interview as many key project personnel as possible, particularly including those from the Ministry, the Department of Agriculture, USAID, and the technical assistance contractors; and
- (3) visit at least one Regional Research Center and one seed processing center.

B. All project files will be available to the evaluators in the office of the Project Manager, Food and Agricultural Development Office, USAID/Colombo. A review of the following background documents is essential:

- Project Paper
- Project Logical Framework (logframe)
- Grant and Loan Agreements
- Updated L.O.P. Workplan
- DAI contract and Scope of Work
- USAID quarterly and six-monthly project reports
- DAI monthly and quarterly reports
- Socio-economic studies completed, in-progress and planned
- The GSL National Agriculture, Food, and Nutrition Strategy Paper and supporting task force papers written in formulation of the strategy.

C. Key persons to be interviewed by the team will include the following: the USAID Project Officers, DOA Project Manager, DAI Chief-of-Party, DAI Team members, DOA Director and Deputy Directors, MALR Secretary and Additional Secretary.

V. Logistic Support:

The Mission will provide office space in Colombo for the evaluation team. The Research Administrator/Management Specialist shall use funds provided in his budget to arrange for car rental, micro-computer rental, office materials, report reproduction, local secretarial support, office space in Kandy, and any other miscellaneous expenses.

VI. Level of Effort:

Services of the evaluation team members will be required for 27 working days. A six-day work week is authorized in-country.

VII. Reports:

The team leader shall be responsible for submitting a draft evaluation report no later than 18 working days after the evaluation team has begun work. Review comments will be given to the evaluation team within 5 working days of submission of the draft. Fifty copies of the final printed report shall be submitted to the USAID project officer prior to the departure of the team from Sri Lanka. The report shall address all questions contained in the Scope of Work and shall include but not be limited to the following sections:

1. Title page.
2. Table of Contents
3. A Basic Project Identification Data sheet (outline attached, attachment .. )
4. An executive summary. (This section will be used for the agency's computerized record of evaluations, so must be able to stand alone as a separate document. It is limited to 3 pages, single spaced, and should contain all elements required on page 25 of the attached ANE Bureau Evaluation Guidelines.)
5. List of Acronyms.
6. The body of the report (limited to approximately 30 pages with any especially lengthy analysis or listing of data placed in the Appendices).
7. Conclusions and Recommendations
8. Any useful annexures or appendices (including the evaluation scope of work, the logical frame work with indications of any modifications during the life of the project, the description of the methodology used in the evaluation and a bibliography of written works consulted).

All copies of the draft report shall clearly be labeled, "DRAFT". The title page of the final report shall include the following disclaimer: "This report presents the independent findings and recommendations of an evaluation team. It does not necessarily represent the official views of the Government of Sri Lanka or the Agency for International Development."

A debriefing will be scheduled at USAID around the time of the submission of the draft report. A similar debriefing may also be scheduled in Peradeniya for the Department of Agriculture.

#### VIII. Relationships and Responsibilities:

The evaluation team will report to the USAID DARP Project Officer and is responsible to him for completion of the evaluation activities. The AID/W Backstop Officer for the evaluation team will be the ANE/TR Officer responsible for Sri Lanka.

#### IX. Team Members

Composition. The evaluation team will consist of two persons: (1) an Agricultural Research Administrator/Research Management Specialist/Team Leader and (2) an Agricultural Economist with AID project design and project implementation experience. The Research Administrator is to be obtained through an Indefinite Quantity Contract (IQC). The Agricultural Economist is expected to be an AID/Washington direct hire employee funded out of Mission Operating and Expense funds.

Qualifications. For both team members, familiarity with Asian agricultural systems, agricultural research, and farming systems research is essential. Extensive field experience in one or more Asian countries, preferably including South Asia, is highly desirable. Strong writing skills are necessary.

The Team Leader Agricultural Research Administrator/Management Specialist should have (1) a Ph.D. in an Agronomic Field, (2) a minimum of eight years experience in agricultural research administration, including at least four years in developing countries, and (3) experience with project evaluation.

The Agricultural Economist is expected to be an AID/Washington staff person with an advanced degree in agricultural economics, familiar with AID project design and implementation, and having experience with agricultural research systems. A former USAID/Sri Lanka staff member who was the design officer for this project is a possible AID/Washington team member.

Responsibilities. The Team Leader/Research Administrator/Management Specialist shall assign specific evaluation and report writing responsibilities to the Agricultural Economist and coordinate the Agricultural Economist's activities with his own to ensure complete coverage of all the items included in the Statement of Work. The Team Leader shall be directly responsible for the completion and timely submission of acceptable draft and final reports. The budget for all in-country evaluation expenses for both team members is contained in the Team Leader's budget; and the Team Leader shall make arrangements and payments for in-country transportation or car rental, micro-computer or other equipment rental, office supplies, photocopying and report reproduction, secretarial support, office space in Kandy (if required) and other miscellaneous expenses. The budget does not include salary or per diem for the Agricultural Economist team member.

PRINCIPAL PERSONNEL CONTACTED

USAID

Peter J. Bloom, Mission Director, USAID/Colombo  
John B. Flynn, Chief, USAID/AGR  
Charles L. Strickland, Co-Project Manager, USAID/AGR  
S.H. Charles, Co-Project Manager, USAID/AGR  
Jan Emmert, Evaluation Officer  
Lakshman Rajaratnam, Civil Engineer  
William A. Binns, Project Officer

DAI

G.W. Selleck, Chief-of-party  
Richard Morris, Agronomist  
Gary Reusche, Seed Specialist  
Del Henderson, Land & Water Management Specialist  
Ian Stewart, Short-term Specialist - Climatology  
Jane Gleason, Short-term Specialist - Soybeans  
Robin Erickson, Short-term Specialist - Baseline Survey

IIE

Shayamalie Dissanayake, Training Coordinator

MADR/DOA

N.V.K.K. Weragoda, Secretary, MADR  
Dixon Nilaweera, Additional Secretary, MADR  
Eddie Herath, Acting Director of Agriculture and DD/Research  
Percy Abeywardena, DD/Extension  
W.D. Albert, DD/SCS  
Edward Suraweera, Acting DD/Agricultural Economics & Projects  
M.D. Samarasinghe, DD/Seeds  
A.M. de Mel, DD/Education & Training  
A. M. Abeyratne, Chief Accountant  
S.B. Rajapakse, DD/Administration  
M.A. Wimal, Superintending Engineer/Research and Development  
L.S.S. Jayasundera, Superintending Engineer/Civil  
S.H. Upasena, DD/Research, Aralaganwila  
Mervyn Sikurujapathy, DD/Research, Maha Illupalama  
L.P. Somadasa, Research Officer, Girandura Kotte  
Mr. Warnakulasuriya, Regional Agricultural Economist, Aralaganwila  
K.A. Ranaweera, AD/Seeds, Peradeniya  
P.B. Rambukwela, ADA/Seeds, Pelwehera  
Yapa Wickramasinghe, Regional Agricultural Economist, Maha Illupalama  
Jayasiri Premaratne, Acting ADA/Seeds, Nikaweratiya  
Nihal Rajapakse, Agricultural Economist, Peradeniya

Representatives of Research Officers and Agricultural Graduate Associations

PGIA/University of Peradeniya

Y.D.A. Senanayake, Director, PGIA  
Kapila Gunasekera, Acting Dean, Faculty of Agriculture  
H.M.P. Gunasena  
Tudor Silva, Department of Sociology, Faculty of Arts

Research Development Consultants

M.G.C.P. Wijayatilleke, Project Manager  
Mr. Jayasundera

Agricultural Research Project  
Dhayan Kirtisinghe, Project Manager

## APPENDIX IV

### KEY DOCUMENTS CONSULTED

1. AID Project Paper - Project 383-0058  
Sri Lanka Diversified Agricultural Research:  
Includes Project Logical Framework and other Annexes: August 1984
2. Grant and Loan Agreements with the Government of Sri Lanka GSL
3. GSL Contract for A&E Services
4. DAI Contract and Scope of Work
5. DAI Subcontracts with iIE (Training), OSU (TA), and AAPC (PSA).
6. Updated L.O.P Workplans of DAI/DARP
7. USAID Quarterly and Semi-annual Project Reports
8. DAI Monthly Quarterly and First Annual Reports
9. GSL National Agriculture, Food, and Nutrition Strategy, Pertinent Supporting Documents thereto, and Review of Progress by USAID/ARD
10. Socio-Economic Studies Completed, in Progress, and Planned
11. Proceedings of the Sri Lanka Seed Workshop-MADR/DOA/Seeds Division; January 26-February 6, 1987.
12. Proceeding of the Workshop on Farming Systems Research and Extension in Sri Lanka-MADR/DOA/Agricultural Economics and Project Division: September 17-20, 1986
13. Draft Report of the Seeds Feasibility Study Team September 1987
14. DARP Technical Staff Work Plans for 1987
15. ARD Briefing Paper - Agriculture in Sri Lanka
16. ARD Briefing Paper - GSL Food, Agriculture, Irrigation, Forestry and Fisheries Related Ministries, Departments, Corporations, Statutory Boards and Committees and Their Activities.
17. Abt Associates Report to World Bank - Review and Analysis of Crop Diversification Options in the Dry Zone of Sri Lanka.
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24. Cost of Seed Production on Selected Governmental Farms. P. Abeygunawardena, Luis Navarro, Gary Reusche: Faculty of Agriculture, University of Peradeniya, Department of Agriculture, Diversified Agricultural Research Project, Economics and Projects and Seed Divisions, August, 1987
25. Department of Agriculture Workplan Related to the activities of the Diversified Agriculture Research Project, September 1987
26. End-of-Tour Report - G.W.E. Fernando, Agronomist, September 1986
27. End-of-Tour Report - L.D. Haws, Agricultural Economist
28. End-of-Tour Report - C.E. Classen, Seed Specialist.
29. End-of-Tour Report - Louis Navarro, Agricultural Economist, September 1987

## Appendix V

### Economics of Expanded SFC Production

The DARP PP stressed that decision-making and resource allocation for agricultural diversification must take into account both farmers' production constraints and the market potential for specific crops. The possibility of over-production, and the constraints imposed by farmers' limited productive resources were understood at the PP stage and, therefore, resources were provided through the project to promote and facilitate the inclusion of social and economic considerations in all research, extension, seed production and training decisions relative to diversification-- i.e., if markets do not exist, there is little point in developing technologies to increase production.

The economics of agricultural diversification are, if anything, a more salient issue at the time of this evaluation, and the role for this element of DARP appears to be increasingly important. Some of the issues and implications are presented here, hopefully to stimulate further consideration and action. Most of the material is drawn from Dr. R. Jiron's study "Review and Analysis of Crop Diversification Options in the Dry Zone of Sri Lanka,"\* and Dr. Luis Navarro's Draft Completion of Assignment Report.\*\*

There are two primary reasons for the attention to agricultural diversification in Sri Lanka, as in several other Asian countries:

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\* Abt Associates, Inc.; June, 1987

\*\* Development Alternatives, Inc., Peradeniya; September, 1987

(1) imminent rice self-sufficiency with little or no export potential for surpluses; (2) improved resource allocation. The trend in rice production and import is shown in Table 1. Rice imports have decreased significantly, and with the full impact of the new Mahaweli lands yet to be felt, periodic surpluses should result. Due to anticipated growth in domestic demand, large surpluses are not likely on a consistent basis. However, the increasing production can be expected to exert a downward pressure on rice prices, which will be felt most by the least efficient producers. In the absence of alternative employment opportunities for such farmers, production alternatives are required.

In terms of efficiency in resource allocation, the primary issue is that of using high cost resources, i.e., massive surface irrigation schemes, to produce a relatively low value crop, i.e., rice. This inefficiency is compounded in the case of those areas unsuited, due to soil type, for paddy rice production.

The rationale for diversification, therefore, can be seen to exist. However, the markets to support a major production push in other field crops as substitutes for rice generally do not exist. Sri Lanka is already at or near domestic market saturation for most SFCs, even given the prevailing low levels of production technology being employed. Trends in area, production and yields for primary SFCs are shown in Table 2. Production, it can be seen, has been generally increasing, albeit with considerable year-to-year variation and no significant increase in per ha. yields. And, evidence exists that more productive production technologies are being employed, e.g., a shift to increasing production

of SFCs under irrigation. Table 3 indicating the extent to which irrigated production of SFCs, an insignificant production regime a few years ago, has developed.

According to both Jiron and Navarro, domestic demand for SFCs is, in itself, generally inadequate to support a large-scale diversification effort. Two exceptions, for which a significant expansion of domestic markets is feasible, are maize and soybean (discussed in more detail below). However, even if imports of these two crops were completely replaced by domestic production, (quite feasible given present technologies) the overall impact on GDP and rural incomes would be relatively minor.

In the case of maize, the estimated 1987 requirement, for food and feed, is roughly 70,000 MT. Imports will total roughly 36,000 MT, or 52% of requirement. The current floor price for maize is Rs.4/kg., or approximately \$133/MT, which is reasonably close to the CIF price of imported maize. The major domestic buyers (COFC and CGE) cite unreliable supply and poor quality of domestic maize as the main reason for reliance on imports. According to a study by DOA Regional Economist Yapa Wickremasinghe ("Production and Marketing Maize in Anuradhapura District" draft, 1987) the average price received by producers in Anuradhapura District (the "floor" price notwithstanding) was Rs.3/kg. However, the average cost of production was Rs.2.3/kg, which could be reduced by increased fertilizer use.

Wickremasinghe points out that while it may be possible to develop other products using maize (e.g., starch, flour, corn flakes), the major market

is, and will continue to be, the feed industry--breeding and production should be oriented toward the needs of that industry. Further, "expansion of maize production makes no sense without increases in demand for local maize." This leads to his recommendation for extension to stress quality control for maize before increased production in order to promote market development.

In the case of soybean, the current annual utilization in Sri Lanka is 25-30 thousand MT. Domestic production in 1984/85 totalled only 3,000 MT. The potential demand may be as high as 115,000 MT per year. As in the case of maize, the primary market is for the feed industry, although there is increasing potential for direct consumption in snack foods and dietary supplements.

The CIF price for imported soybeans is \$210-240/MT (Rs.6.3-7.2/kg.), compared to the current "floor" price of Rs.7.0/kg. Tariffs on imports of soybean and soy meal are 75% and 5% respectively. However, the principal importers (CGE and COFC) either are allowed duty free imports, or receive rebates. A case can be made for a modest import duty (10-15%) that, uniformly applied, would yield increased government revenue, and would provide domestic producers and middlemen a small margin within which to work to increase productivity and improve quality. However, more important is the joint consideration and coordination of the GSL's production and import quotas/tariff policies with regard to the SFCs and agricultural diversification.

For both maize and soybean, economic surveys indicate that farmers can make money at Rs.7/kg. for soybean and Rs.4/kg. for maize, and that increased capital inputs (primarily chemical fertilizer) can result in reduced unit costs of production. For both crops the market is poorly organized and inefficient (albeit competitive) due to high capital costs, poor quality control, erratic and unreliable prices and "floor" prices, and inadequate information flow. The potential, however, clearly exists for both to expand production to fully meet domestic requirements. The obvious need is to somehow get producer and buyer together in an integrated system.

In general, though, while there may be domestic market potential for selected crops, import substitution in Sri Lanka has been relatively successful, and is facing limits. (See Table 4 for trends in principal commodity imports.) Imports of potatoes and onions, for example, have declined significantly, and import of chillies is on an overall downward trend. Therefore, a significant increase in exports is essential to effective agricultural diversification, but even here there is a relatively small number of crops in which Sri Lanka currently holds a competitive advantage relative to other countries in the region: sesame, black gram, groundnut. It should also be borne in mind that the "comparative advantage" concept is a dynamic one, and many factors can act to alter the present situation; i.e., while Sri Lanka may hold some degree of comparative advantage at present, this will most likely not continue indefinitely. Capacity to continually monitor and respond to changing economic conditions is essential. Recent trends in export of SFCs is shown in Table 5.

It can be seen that exports show a wide range of variation and no general trend, with no crop showing particular strength. Exports of sesame, which totalled 23,000 MT in 1982, plummeted to 1,000 MT in 1984, apparently as a result of quality control and reliability problems. Sri Lanka's relatively insignificant market share, cited by some observers as a positive fact due to the growth potential, is, in fact, a disadvantage under present conditions of poor quality and unreliability, as buyers have no qualms over dropping Sri Lanka entirely as a supplier. And markets, once lost, are difficult to regain.

A complicating factor is that the SFC in Sri Lanka serve both traditional subsistence as well as market roles. It appears that, although most OFC production ultimately enters market channels, farmers resource allocation decisions are based (logically, from their perspective) more on subsistence needs, risk aversion and cost minimization considerations than profit or production maximization. There is clearly a need to better understand relative roles and the bases for farmers' production and resource allocation decisions. What is clear, based on present SFC production practices, is that major emphasis at this point in the diversification effort, must be placed on "least cost" production technologies rather than "yield maximizing" technologies.

Another important variable influencing SFC production decisions in the the GSL's rice price policy, and the rice/wheat price ratios. For example, lower rice prices to farmers will mean an increase in the relative (if not absolute) profitability of certain SFC production. However, lower retail rice prices will mean increased rice consumption and decreased demand for SFC substitutes for rice (sorghum, millet,

cassava). The interrelationship and impact of these variables clearly needs further study before appropriate policy and program decisions can be formulated.

In summary, there is evidence that some SFC (especially chillies, soybean, cowpea, greengram and groundnut) can bring higher per acre net return than paddy rice on irrigated land. For rainfed conditions there is basically no substitute to the SFCs. Markets (both overall effective demand and market organization/efficiency) pose the major constraint at this time.

Jiron concludes that, "Diversification... ought to be based on a combination of objectives," and that sound and thorough economic analysis must guide production and resource allocation decisions. Major needs have been identified as:

- more and better analysis of available production technologies (including development of production functions for key variables);
- thorough examination of the options for a reorganized, better coordinated domestic market system;
- a major, vertically integrated export drive for traditional OFC export crops, together with studies of the potential for new export crops and markets;
- policy environment studies, e.g., the relationship of price, tariff and quota policies for agricultural diversification.

The implication for DARP is plain--the GSL will need to move quickly and effectively to reduce unit production costs and develop and promote markets if agricultural diversification is to have any potential as a viable long-term strategy for agricultural development.

TABLE 1

Paddy Production: Rice Availability and Imports

Year	Gross Ext-ent Sown: '000 ha.	Net Extent Harvested '000 ha.	Total Paddy Production '000 tons	Average Yield kg./ha.	Rice Produc-tion* '000 tons	Net Domes-tic Supply** '000 tons	Rice Impor-t*** '000 tons
1970	760	611	1,616	2,664	1,131	995	534
1971	726	590	1,396	2,366	977	860	339
1972	727	543	1,312	2,416	918	808	266
1973	725	571	1,312	2,298	918	808	344
1974	825	681	1,602	2,353	1,121	958	332
1975	696	509	1,154	2,270	808	711	457
1976	724	541	1,252	2,315	876	771	419
1977	828	666	1,677	2,521	1,174	1,033	526
1978	876	724	1,891	2,613	1,286	1,132	160
1979	839	697	1,917	2,750	1,304	1,148	212
1980	845	728	2,133	2,927	1,450	1,276	190
1981	877	740	2,230	3,014	1,516	1,334	157
1982	845	661	2,156	3,260	1,466	1,290	160
1983	825	689	2,484	3,591	1,689	1,486	123
1984	990	779	2,398	-	1,631	1,435	26

\* Conversion factor of 1 metric ton of paddy = 0.68 metric tons rice.

\*\* Rice production less 12% for seed and wastage.

\*\*\* Not adjusted for 2.5% slackage loss.

Source: Sri Lanka: Recent Economic Development and Policies Growth, World Bank, 1985.

New high yielding varieties (BG34-8, BG276-5, BW262-6B three-month duration), (BG94-1, BG34-6, BW267-3 three-and-half-month duration), and (BG1-11, BG400-1, BW100 four to four-and-half-month duration), modern practices, increased irrigation supply, improved extension, guaranteed price, and support services have led to per acre yield increase of 50.5 bushels in 1970 to 69.7 bushels in 1983. (Note: 1 Bushel/acre = 51.55 kg./ha., and 1 ha. = 2.47 acres.) Registered seed is produced in several state farms while certified seed is produced on a contract basis by farmers. The pests (planthoppers, specifically brown planthopper, gall midge, thrips, and stemborers) and diseases (ratoon stunt virus, blast and sheath blight) affect paddy in Sri Lanka. A guaranteed price scheme is in operation. However, GSL purchases through the Paddy Marketing Board (PMB) varies from about 3-13% of the total production with the private sector now playing a dominant role in paddy purchasing, processing and marketing. The Table below gives paddy production statistics in Sri Lanka compared with selected neighbouring countries.

TABLE 2

Area, Production, Yield and Coefficient of Variation of Selected "Other Field Crops"  
(Area in Hectares; Production in Metric Tons; Yield MT/HA)

	AREA	PRODUCTION	YIELD	COEFFICIENT OF VARIATION		
				AREA	PRODUCTION	YIELD
<u>MAIZE</u>						
1972/73 - 1976/77	33,975.8	29,060.8	0.8	17.4%	33.3%	26.5%
1977/78 - 1981/82	27,744.8	33,033.4	1.2	13.6%	12.8%	5.8%
1982/83 - 1983/84	45,025.0	45,081.0	1.0	4.4%	13.3%	9.0%
<u>KURAKKAN</u>						
1972/73 - 1976/77	21,959.6	15,800.8	0.7	33.6%	39.0%	18.9%
1977/78 - 1981/82	12,756.2	10,439.6	0.8	25.0%	28.3%	6.0%
1982/83 - 1983/84	18,210.5	9,430.5	0.5	8.1%	24.4%	16.6%
<u>GREENGRAM</u>						
1972/73 - 1976/77	9,194.4	5,501.8	0.6	25.9%	28.9%	6.3%
1977/78 - 1981/82	15,478.6	13,647.0	0.9	21.7%	31.8%	13.8%
1982/83 - 1983/84	29,371.0	16,834.0	0.6	7.0%	3.8%	3.3%
<u>BLACKGRAM</u>						
1972/73 - 1976/77	4,565.0	3,240.8	0.6	107.6%	132.5%	25.3%
1977/78 - 1981/82	10,149.6	7,206.2	0.7	20.2%	17.6%	12.7%
1982/83 - 1983/84	24,680.5	9,206.0	0.5	29.0%	41.0%	62.6%
<u>COWPEA</u>						
1972/73 - 1976/77	12,690.2	9,087.8	0.8	83.9%	77.3%	19.8%
1977/78 - 1981/82	30,884.8	27,608.6	0.9	14.2%	29.0%	18.7%
1982/83 - 1983/84	37,612.0	26,856.5	0.7	18.6%	16.8%	1.8%
<u>SESAME</u>						
1972/73 - 1976/77	15,268.4	8,500.8	0.5	17.7%	42.4%	29.6%
1977/78 - 1981/82	24,491.8	16,976.2	0.7	27.4%	27.9%	24.2%
1982/83 - 1983/84	18,323.0	11,323.5	0.6	73.6%	77.7%	9.5%
<u>PEANUTS</u>						
1973/74 - 1976/77	7,188.0	6,726.3	0.9	8.2%	12.6%	4.5%
1977/78 - 1981/82	9,916.4	11,235.2	1.1	31.3%	35.4%	17.7%
1982/83 - 1983/84	10,683.0	12,612.0	1.1	28.7%	50.1%	24.9%
<u>SOYBEANS</u>						
1973/74 - 1976/77	1,048.0	985.0	1.0	20.4%	17.4%	12.1%
1977/78 - 1981/82	2,828.6	3,389.8	1.1	86.7%	97.3%	9.8%
1982/83 - 1983/84	12,861.0	9,792.0	0.8	8.5%	18.5%	10.2%
<u>CHILLIES</u>						
1972/73 - 1976/77	39,713.6	23,381.2	0.6	10.7%	31.7%	23.5%
1977/78 - 1981/82	25,300.0	22,469.2	0.9	18.2%	18.8%	9.9%
1982/83 - 1983/84	31,386.0	28,513.5	0.9	2.0%	5.5%	3.5%
<u>RED ONIONS</u>						
1972/73 - 1976/77	7,132.0	53,081.0	7.5	9.9%	37.4%	39.9%
1977/78 - 1981/82	7,267.4	80,650.8	11.1	14.1%	15.5%	3.5%
1982/83 - 1983/84	9,904.0	89,588.0	8.4	17.5%	56.3%	43.0%
<u>POTATO</u>						
1972/73 - 1976/77	2,665.2	34,170.0	12.8	10.6%	14.1%	10.5%
1977/78 - 1981/82	4,443.8	56,615.8	12.6	22.7%	28.7%	10.9%
1982/83 - 1983/84	7,266.0	90,453.0	12.4	8.7%	8.8%	0.1%

TABLE 3

## Pattern of Cultivation of Important "Other Field Crops"

	RAINFED		IRRIGATED		TOTAL	
	MAHA	YALA	MAHA	YALA	MAHA	YALA
Banana	13,839	0	1,050	0	14,889	0
Sugarcane	7,205	0	16	0	7,221	0
Cotton	700	0	0	0	700	0
Tobacco	3,350	205	0	0	3,350	205
Maize	30,030	0	0	0	30,030	0
Kurakkan	12,175	225	0	0	12,175	225
Greengram	9,305	1,300	28	2,446	9,333	3,746
Blackgram	17,163	363	0	130	17,163	493
Cowpea	22,305	4,063	20	3,715	22,325	7,778
Sesame	4,135	24,855	0	0	4,135	24,855
Peanuts	11,365	2,250	85	855	11,450	3,105
Soybean	12,528	284	29	4,040	12,557	4,324
Chillies	11,448	900	2,015	19,607	13,463	20,507
Onions	1,258	90	3,985	4,531	5,243	4,671
Vegetables	20,307	6,122	0	0	20,307	6,122
Yams and Tubers	23,543	4,022	0	0	23,543	4,022
Potato	999	0	0	0	999	0

TABLE 4

IMPORTS OF SELECTED OTHER FIELD CROPS  
(PRODUCTION AND IMPORTS IN METRIC TONS)

	CHILLIES		POTATOES		MAIZE		ONIONS		CORRIANDER SEED	DRIED LEGUMES*
	PRODUCTION	IMPORTS	PRODUCTION	IMPORTS	PRODUCTION	IMPORTS	PRODUCTION	IMPORTS	IMPORTS	IMPORTS
1972	12,096	19,776	49,692	5,942	13,715	1,942	59,032	1,025	276	9,763
1973	19,010	206	39,596	1,275	13,636	7,289	68,728	nil	307	24,405
1974	17,475	nil	30,368	10,027	23,852	1,385	31,340	nil	296	12,341
1975	15,249	nil	26,871	587	34,636	nil	72,837	nil	120	9,953
1976	32,974	nil	58,150	870	31,791	nil	26,665	nil	50	4,246
1977	31,598	1,000	35,885	141	41,989	nil	66,337	nil	300	N/A
1978	27,862	5,942	29,401	5,967	33,900	nil	72,244	18,152	N/A	N/A
1979	15,439	8,427	48,803	8,290	26,035	1,000	62,555	12,925	6,900	22,969
1980	25,567	13,385	76,810	11,071	31,365	nil	79,912	18,609	5,500	22,740
1981	21,248	580	63,398	1,000	35,296	1	92,429	4,005	5,299	8,432
1982	22,220	3,362	64,667	nil	5,671	2,461	96,294	3,937	4,339	9,222
1983	30,033	9,284	82,494	860	51,066	20	139,992	1,484	8,227	22,499
1984	26,944	8,154	98,412	214	39,096	4,200	39,184	2,687	6,031	57,223

N/A: data not available; nil: available data indicates no imports

Note: Production figures correspond to the growing seasons as reported by the Department of Agriculture. Import figures correspond to imports during a fiscal year.

\*This category includes 90% of Masoor dalh

Source: Customs Department, Cooperative Wholesale Establishment & Statistical Unit, Ministry of Agricultural Development and Research, National Planning Division, Ministry of Finance & Planning based on Customs Department Publications, Food and Nutrition Statistics published by the F&NPD, Ministry of Plan Implementation, July, 1982

TABLE 5

Exports of Selected Other Field Crops  
(In Metric Tons)

	MAIZE	SESAME	MILLET	BLACKGRAM	CASSAVA	GROUNDNUTS	CASTOR SEEDS	OTHER OIL SEEDS
1975	nil	7,101	nil	nil		nil	100	120
1976	4	5,100	229	nil	2	nil	600	300
1977	nil	8,000	7,795	nil	nil	nil	70	170
1978	nil	13,000	296	nil	nil	nil	400	200
1979	6	12,000	6,106	1,154	17	1,467	700	1,000
1980	nil	12,000	1,379	1,055	10	1,665	1,000	2,000
1981	3	13,000	1,238	1,310	nil	2,146	1,000	2,000
1982	nil	23,000	661	642	34	1,061	5,000	1,000
1983	100	5,000	1,191	103	66	nil	2,000	2,000
1984	nil	1,000	528	nil	144	nil	3,000	200
1985	500	2,000	155	589	194	nil	2,000	50

N/A: data not available; nil: available data indicates zero exports.

Sources: Food and Nutrition Statistics, 1982. F&NPPD, Ministry of Plan Implementation; Agroskills Ltd. Subsidiary Food Crops Marketing Study, Colombo, Sri Lanka, October, 1983; Data files on export trade by the National Planning Division of the Ministry of Finance and Planning, Sri Lanka.

APPENDIX VI

TECHNICAL ASSISTANCE PROVIDED TO DATE

Long Term

Chief-of-Party: G.W. Selleck (DAI), 36 PM upto August 1988  
 Research Agronomist R.A. Morris (OSU), 18 PM upto February 1988  
 Soil/Water Management Specialist D.W. Henderson (DAI), 18 PM upto December 1987  
 Seed Specialist G.A. Reusche (DAI), 24 PM upto September 1988  
 Agr. Production/Marketing Economist L.A. Navarro (OSU), 24 PM upto August 1987  
 Training Co-ordinator S.L. Dissanayake, 30 PM upto August 1988 (IIE)  
 Office Manager L.R. Peiris (RDC), 36 PM upto August 1988

Short-term

J.M. Wolf (DAI)	1.75 PM (October/November 1985)--Start-up
T. Cussack (CSU)	0.25 PM (November 16-22, 1985)--Training
N. Goodman (IIE)	1.00 PM (November 17-December 13, 1985)--Manpower survey
R. Erickson (DAI)	4.50 PM (October 29, 1985-March 1986)--Baseline Survey
J. Van Sant (DAI)	0.75 PM (February 6- 27, 1986)--Computer Management
H. Youngberg (OSU)	0.50 PM (April 26-May 11, 1986)--Agronomy
R.A. Morris (OSU)	0.50 PM (August 9-24, 1986)--Agronomy
W. Fernando (RDC)	4.00 PM (May 1-August 23, 1986)--Agronomy
J. Alex (DAI)	2.0 PM (March 4- April 31, 1986)--Weeds
B. Haws (DAI)	4.5 PM (September 30, 1986-February 1987)--Extension
G. Nott (DAI)	3.5 PM (September 6-December 1986)--FSR/E Workshop
C. Classen (DAI)	3.0 PM (February 17- May 17, 1986)--Seeds
C. Classen (DAI)	2.5 PM (August 12-October 31, 1986)--Seeds
D. Mickelwait (DAI)	0.25 PM (September 28 - 30, 1987)--Administration
P. Abeygunawardena (RDC)	3.0 PM (February-April, 1987)--Agr. Economics
G. Nott (DAI)	2.5 PM (January 8 - March 10, 1987)--Seeds Workshop
Edwin Price (OSU)	0.2 PM (June, 1987)-- Administration
M. Ali	
N.S. Maini	
C. Machrad	
P. Wanapee	
G.S. Vollmer	
J.M.Z. Silva	
R. Erickson (DAI)	5.75 PM (May 11-October 31, 1987) Baseline Survey Analysis
J. Gleason (INTSOY)	10.00 PM (May 22, 1987-March, 1988)--Part-funding with INTSOY and UNDP
S.M.M. Zuhair (RDC)	6.00 PM (March-September, 1987)--Agr. Economics
J. Douglas	
N.S. Maini	
J.M.Z. Silva	
Y.D.A. Senanayake	
P. Abeygunasekera	
	1.0 PM each (August 24-September 25, 1987) Seed Feasibility Study
T. Abeysekera	2.0 PM (July 24-September 25, 1987)--Seed Feasibility Study
Ian Stewart	2.0 PM (May 5- October 2, 1987)--Ag. Climatology

S.H. Charles: cdes  
 September 29, 1987



UNITED STATES GOVERNMENT  
**memorandum**

DATE: July 16, 1987  
 REPLY TO: S. H. Charles, AGR  
 ATTN OF:  
 SUBJECT: Diversified Agriculture Research Project (383-0058) - Training (LT) Split Program.  
 TO: Ref: Discussions at the DARP/Project Management Committee meeting yesterday (7/8/87), Background to the decision to have split degree programs.

## Files:

It is apparent that the concerns of the participants arise out of their inability to get US degrees. Most of the problems we face in DARP stem out of this displeasure.

DARP in association with GSL agreed on the split program mainly to:

- undertake relevant in-country research
- increase the number of participants trained
- give all students an overseas training experience
- homeonize the LT training to prevent disparities arising from some receiving overseas degree training v.s. local degree training.
- utilize the investments made in PGIA
- fully develop PGIA capabilities and recognition
- overcome attrition problems

The DOA and the MADR have agreed to extend this concept to other donor agencies too. Given below is a summary, in sequence, of the Project Management Committee and Project Co-ordinating Committee decisions:

PMC meeting February 12, 1985:

The Chairman (D/DOA) stressed the need to utilize PGIA to the maximum possible extent, reasons being that trainees should undertake in-country research and to minimize the non-return of participants to Sri Lanka.

PCC meeting September 25, 1985:

It was decided that the entire training program particularly M.Sc and Ph.D should be reviewed in relation to facilities available at PGIA. PM/DARP to discuss with Director PGIA and report.

PMC meeting October 15, 1985:

The then Director (PGIA) stated that mixed MS degrees would take longer than 2 years, the normal duration. The courses taken in US or other universities have to be recognized by the Academic Committee of the PGIA; that the PGIA Library facilities are quite good and computer facilities adequate. Staff was adequate for supervision of these research work. He attributed delays in graduation to student lapses. The PMC agreed to the following:

PGIA would be utilized for LT training under DARP as far as possible for split degrees where course work will be done in a US or Third Country University and thesis research in Sri Lanka and degree awarded by the PGIA.

- Exceptions -
- where candidate is already enrolled for a Ph.D program.
  - where PGIA cannot provide training in certain areas of specialization.
  - where Deputy Directors make justifiable appeals in special situations.

PMC meeting March 10, 1986:

Deputy Director Research (Dr. Eddie Herath) pointed out that in the LT Training plans adopted, the 3 categories of training opportunities (Full US, US/PGIA split, Full PGIA) have different cost implications and benefits to trainees. He argued that a more equitable distribution of training should be adopted and such a distribution would enable more candidates to undergo LT training.

PMC decided that all LT trainees under DARP would undertake split US/PGIA training programs. Exceptions only in special circumstances as determined by D/DOA (with concurrence from USAID).

PMC meeting July 11, 1986:

Stressed close collaboration between DOA and PGIA in implementing the split program. Candidates will discuss their course work programs and obtain PGIA approval. The D/DOA will sign the candidates' agreement only on condition that such procedure is followed.

Before committing funds for LT additional training each DD would draw up a plan for additional training.

A letter was tabled from the Director PGIA requesting the appointment of a D.O.A. staff member as a full time training liason officer with the PGIA. It was the view of the Committee that since PGIA has already assured the DOA that it has the necessary staff, equipment, laboratory, computer and research facilities to train DOA scholars the question of appointing a full time DOA person to deal with problems relating to Post graduate research of students will not arise.

PCC meeting May 26, 1986:

PCC ratified the split training program for all participants. Since all PG Training are on a split basis, selected officers should meet their PGIA Board of study so as to enable the Board, to recommend the courses to be followed in the US. Director, PGIA requested DOA to identify research expenses at PGIA and also provide a vehicle for supervisors.

PMC meeting January 22, 1987:

Deputy Director Research suggested degree awards from foreign universities in 'some' cases under the split program. AID's contention was that such considerations were possible if justified by the DOA. Regarding visits by D/PGIA to US universities for strengthening linkages: DOA had no objection provided no DARP training funds are utilized for the purpose.

PCC meeting May 4, 1987:

Exclusive PGIA degree award has caused heartburn. Suggestion made to modify so that some foreign university awards could be incorporated. The Deputy Director Research was directed to discuss the problem case by case with the regional DDRs and appraise D/DOA to enable him to take up the matter with AID. (action awaited).

The above decisions clearly commit all parties to the split degree program. However, if the split nature has to be changed to accomodate course work in Sri Lanka and degree elsewhere or if possibilities of Joint degrees are to be investigated, further discussions and negotiations are necessary.

The USAID \$90 per month allowance is meant only for research/thesis costs in Sri Lanka for the 2nd year. DOA has to negotiate with MADR and Treasury for other participant costs like per diem or scholarship allowance.

It is very clear that whatever the source, the participants need an allowance other than their salaries. DOA maintains that they are on study leave and hence are not entitled to a subsistence payment from GSL. This is a very special situation and hence GSL has to make a decision. Chief Accountant stated that it may be possible to get the Treasury to make an exception if the special situation is explained.

The next question is whether the PGIA, can - in keeping with its original commitments - handle all the DARP trainees about 20 end of this year and more next year. The Agricultural Education Development Project final evaluation found that the capacity of the PGIA/FA to do quality research and excellent graduate level teaching has been increased.

These matters are to be discussed by a newly formed Committee according to the PMC meeting decision on July 8, 1987. Hope we can find a quick solution.

cc: AGR:CLStrickland  
AGR:JRLee  
A/D:GLNelson

AID:AGR:SHCharles:v1  
July 16, 1987.  
COMREF:AGRSHC36

## APPENDIX VIII

## Short Term Training

## Short Courses Completed, 1985

Dept. Division	Field of Training	Location	No. of scholars	Person Months
Seed Div.	Seed Improv.	Mississippi State, Univ. U.S.A.	3	6p/m
Econ. Div.	Project Implem.	Arthur D. Little Man. Inst.	1	1.5p/m
Res. Div.	Agric. Res. Ngnt.	USDA	2	2.5p/m
Res. Div.	North Amer. Rhizobium Conf.	Honalulu	1	.25p/m
Seed Div.	Seed Technology	Ministry of Agric. & Food, Thailand	4	2.0p/m

Short Courses Completed, 1986

Dept. Div.	Field of Training	Location	No. of Scholars	Person Months
Seeds Div.	Cowpea & Soyabean	IITA, Nigeria	1	6 p/m
Ext. Div.			2	
Res. Div.	Rhizobium Technology	NIFTAL, Thailand	1	1 p/m
Ed & Tr. Div.	Cropping Systems	IRRI, Philippines	1	5 p/m
Res. Div.	Alley Cropping & Alley Farming	IITA, Nigeria	1	2 p/m
Ed. & Tr. Div.			1	
Res. Div.	Use of Computer in Agriculture	PGIA, Peradeniya	16	8 p/m
Res. Div.	Remote Sensing	Univ. of New Mexico	1	1 p/m
Seed Div.	Farm Mgmt	IRRI Philippines	3	2 p/m
Res. Div.			1	
Res. Div.	Mgmt. Agric. Research	USDA	1	1.25 p/m
Seed Div.	Seed Quality Control & Certification	Bureau of Plant Ind., Philippines	3	9 p/m
Ext. Div.	Intr. & Extension	CINABCO Israel	1	1.5 p/m
Ext. Div.	INTERPAES (Agric. Ext.)	Univ. of Illinois	2	2 p/m
Ext. Div.	IPM	IRRI, Philippines	2	12 p/m
Res. Div.			1	
Ext. Div.	Water Management	AIT, Thailand	5	6.25 p/m
Econ. Div.	Agric. Economics	IRRI Philippines	4	8 p/m
Res. Div.	Cowpea & Soyabean	IITA, Nigeria	3	6 p/m
Res. Div.	Irrig. & Soil Mgmt.	Volcani Israel	1	4 p/m
Ext. Div.			1	

Contd.... 1986

Dept. Div.	Field of Training	Location	No. of Scholars	Person Months
Res. Div.	Vegetable Production	AVRDC Thailand	2	10 p/m*
Res.Div	Farming	IRRI, Phil/	4	4 p/m
Ext.Div	Systems	BRRI,	2	
Ed&Tr	Tour	Bangladesh	1	
Econ.Div			1	
Res. Dev.	Use of Comp. in Agric.	PGIA	14	7.0 p/m

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Short-term programs completed and commenced, 1987 (THROUGH SEPTEMBER 1987)

Dept. Div.	Field of Training	Location	No. of Scholars	Person Months
Res.	Veg. Prod.	AVRDC Thailand	2	10.0
Ext.	SFC	IITA, Nigeria	2	4.0
Res.	Design & Analysis	Faculty of Agric.	10	7.5
Res.	Remote Sensing	AIT Thailand	2	7.0
Seed	Seed Improve.	Mississippi State USA	2	4.0
Ext.	Farming Systems	ICRISAT India	1	6.0
Res.	Green Manure Con.	IRRI	2	.75
Ed&Tr.	Mgmt of Agric. Org.	USDA USA	1	1.25
Res.	Trop. Root Cr.	IITA Nigeria	2	4.5
Econ.	Proj. Plann.	USDA USA	1	1.0
Ext. Seeds Seed Cert. Ed&Tr	English	Fac. of Eng.	12 i 2 2	8.5
Res.	Mgmt of Agric. Res.	USDA USA	1	1.5
Econ.	Proj. Imple.	USDA	1	1.75
Econ.	study tour	IRRI	2	.5
Res.	study tour	LEHRI Indonesia	2	.5
Ext.	IPM	IRRI	2	8.0
Ext. Ed & Tr	Tech. Transfer	IRRI	3 3	18.0
Ed & Tr.	Trop Mgmt	AIT	2	3.0
Res.	Plant Quaranta	USDA	2	3.5
Ext.	Irrig Water Mgmt.	IRRI	2	3.0

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PGIA Based "Split Postgraduate Training"  
Programme for the Department of Agriculture Officers

Summary

1. The AGA asserts that the newly formed policy of training DOA officers at PGIA will lead to the deterioration of competence and morale of the staff, resulting in ultimate loss of value and productivity of the DOA - one of the oldest and well-established organizations in Sri Lanka -.
2. The longstanding practise of DOA of training young officers at their prime age of intellectual maturity in advanced countries has been subjected to gradual deterioration. Also the actions taken by DOA on matters pertaining to postgraduate training of officers have not shown any clear criteria or rationale. The acceptance of PGIA as a essential component in the postgraduate level training of the DOA officers has worsened the situation, causing discontent among officers in the DOA.
3. PGIA is not equipped to provide training of acceptable standard to DOA officers. It is evident that the PGIA is inexperienced, poorly staffed, inadequately equipped and gravely short of facilities necessary to offer a type of training required by officers of the DOA.

The PGIA has conferred only 225 degrees in its life span of 9 years, of which 69% are non-research course work M.Sc.s. Research Masters degrees and Ph.D's were produced only at the rates of 6 and 1.4 per year respectively.

Statistics presented by Director/PGIA indicates that out of 542 candidates registered at PGIA 122 (23%) have abandoned the programmes without completing the degrees they registered for.

In spite of the fact that the prescribed period for a M.Phil is 2 - 2 1/2 years, on an average 4-5 years have been taken by a student to complete a M.Phil degree. The main reason for this has been the inadequacy of facilities and staff at PGIA.

Director/PGIA admits that PGIA does not have its own academic, technical and supporting staff and hence it depends mainly on the staff in the Faculty of Agriculture (FOA). The majority of the staff at FOA earned their post graduate training between 1980-1985 and hence have very little experience in teaching and research.

PGIA also do not offer courses in many fields relevant to DOA. Even in fields like Advanced Statistics and Mathematics which are essential for a satisfactory postgraduate training PGIA has run into problems.

The Laboratories, Computer facilities, Experimental Stations and Library services available in the PGIA are totally inadequate to provide a satisfactory training at the postgraduate level.

PGIA utilizes laboratories of the Faculty of Agriculture which are basically equipped for undergraduate work.

PGIA has already informed the DOA of its difficulty in providing computer facilities to DOA students.

PGIA does not have a single experimental station for the use of its students thereby causing a series of practical problems and training problems to students from DOA.

PGIA does not have its own library and the Faculty of Agriculture library improved for PGIA use remains very much sub-standard.

4. PGIA efforts to introduce administrative rigidities to compulsorily channel officers of government institutions to PGIA for postgraduate work is an attempt to conceal these shortcomings and the inability to compete with other institutions to attract students.
5. Since the cost of training 2 officers full time abroad is equivalent to that of the training of 3 officers under split programme, when the hidden factors of extremely lacking capacity, extra-long durations for completing studies etc. leading to poor quality of product are taken into consideration there are hardly any gains for the DOA.
6. The present policy of forcing DOA officers to PGIA for training depriving them from obtaining qualifications that help in the career advancement as professionals and associated financial benefits has led to poor motivation among the officers of the DOA.
7. In view of these and many other factors described in the report the Agricultural Graduate Association feels that the present split postgraduate training should be immediately abandoned.

1. Background of the Problem

First and foremost we like to recall the fact that the Department of Agriculture with a history dating back to 1822 and a strength of about 5100 technical officers, is the oldest and largest institute engaged in agricultural research and development in Sri Lanka. This organization can claim the largest contribution to the agricultural development of Sri Lanka and to the stock of knowledge in agricultural science. DOA is responsible for publishing worlds first ever journal on tropical agriculture and it has produced many scientists of international reputation. Nevertheless, this reputed institution is presently in the danger of losing her foothold in Sri Lankan agricultural research and administration mainly due to faulty policies regarding training of officers at post graduate level. The newly formed policy of training people in the Post Graduate Institute of Agriculture (PGIA) at the University of Peradeniya, which is only 10 years old and devoid of any significant contribution to Sri Lankas agriculture compared to DOA will undoubtedly deteriorate the strength of DOA which was built up over a period of 165 years.

We do not make this statement on our emotions but purely on objective reasoning. Like in any organization, in DOA too the productivity depends on the competence and the  morale of the staff. In this report, we intend to show how the present "split programme" post graduate training can adversely affect both these attributes, resulting ultimately in a loss of value and productivity of DOA.

2. Brief history of scholarship awards for graduate studies

The practice of the DOA until about 1983 had been to recruit young graduates as staff officers with the intension of sending them for post-graduate training in developed countries, mostly within the first 5 years of service. Until mid 1970s, competent and willing officers were given the opportunity to extend their studies leading to Ph.D at one stretch. This provided an excellent opportunity to officers to expose themselves to modern developments in science at the prime age of intellectual maturity and gave ample time after their return to apply the acquired knowledge in their carrier in DOA. However, since mid 1970s, officers in general were asked to return to Sri Lanka after completing their M.Sc.s, even when they had proven themselves to be of high acadamic caliber and availability of funds was not at all a constraint. It is disheartening, however, to say that even this was not carried out according to a well delineated policy and there were some "exceptions to the rule" causing general discontent among the officers in DOA regarding the so called "scholarship policy". This deteriorating situation has now been heightened by the intrusion of PGIA into the post graduate training programmes for DOA officers and the acceptance of PGIA as a necessary component of such programmes, in the "scholarship policy of DOA" which is actually non existant. If such a policy was existing the officers to whom this policy is catering should be made aware of its contents. Whenever questions were raised in this connection by affected individuals, the responses received have not revealed any clear criteria or rationale behind the actions supposedly resulting from the policy. The policy remains behind closed doors at high levels of DOA.

We reiterate that this discrimination in post graduate training and the closed door policy backing it are causing rapid destruction of both technical competence and morale of the young officers in DOA.

### 3. PGIA as a Institute of Advanced Studies

The critical question we have to answer at this point is whether PGIA is an institute of the required caliber to be accepted at policy level as an integral component of the post graduate training programmes of Sri Lanka's oldest, strongest and the most active organization in agricultural field.

Our argument here revolves around the fact that the quality of the training provided under this programme is far below the standards expected from a post graduate training. Split programmes as practiced now under the funds of Diversified Agricultural Research Project (DARP) is designed such that the candidates register in PGIA, proceed to USA for their course work and come back here and conduct thesis research in Sri Lanka and obtain the degree from the PGIA. We assert that PGIA is not equipped to provide a training of acceptable standards.

In the past, PGIA has lobbied openly to win a place in the scholarship programmes of DOA and other government agencies as clearly indicated by the Director, PGIA in his paper "Stages of Development of the Post Graduate Institute of Agriculture" (which will be referred to as Director/PGIA paper, 1986 in the rest of this report) presented in the meeting on "Future Development of the Faculty of Agriculture and the Postgraduate Institute of Agriculture", sponsored by the University Grants Commission, held in May 1986. However, only the DOA has taken PGIA seriously and fallen prey to this appeal according to the statistics presented by Director/PGIA.

#### Number of registrants at PGIA (1975 to 1985)

Year	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	Total
No. of Private Students	4	4	11	16	16	20	31	22	30	21	22	187
DOA Officers	3	5	12	8	8	6	14	11	8	3	5	61
Officers from 52 other Institutions	4	11	30	19	17	36	20	42	22	25	36	274
Total	11	20	53	43	41	62	65	75	60	49	63	542

Director/PGIA in his paper states the numbers of degrees conferred by PGIA from 1976 to 1985 as follows:

Degree	Number	Average per year
M.Sc. (Non research)	157	17
M.Phil (Course work plus research)	55	6
Ph.D	13	1.4
Total	225	

PGIA has conferred only 225 degrees in its entire life span of 10 years, of which 69 per cent are non-research course work M.Sc.s. Research masters degrees were produced only at the rate of 6 per year and Ph.Ds. only at the rate of 1.4 per year. This is not an impressive record for an institute to be accepted by DDA as its principal trainer at post graduate level.

According to Director/PGIA the total number of registrants in PGIA is 542 and the number of degrees conferred so far is 225. This implies that 317 students are yet to receive their degrees but the number of current registrants is only 195 (Director/PGIA report 1986). What has happened to the remaining 122 candidates? They are neither registered nor have they got the degrees.

We have evidence to show that some students had completed their work and waited for thesis defence for more than 6 months. Some others could not finish their studies within the prescribed 2 to 2 1/2 years (for an M.Phil) due to inadequacy of facilities and in some cases due to refusal of some staff members to conduct lectures and serve in thesis advisory committees. On the average 4 to 5 years have been taken by M.Phil students to complete their studies.

#### 4. PGIA Academic Staff

Director/PGIA (1986) admits that PGIA does not have its own academic technical or supporting staff and depends in this respect on other faculties, DOA and other institutions. Eighty percent of the staff is from the Faculty of Agriculture, whose major responsibility is not to the PGIA. We also have evidence to show that in PGIA some Boards of Studies have not cooperated fully in conduct of post graduate programmes, if such information is needed. But here, we concentrate mainly on inadequacy of facilities at PGIA to offer effective post graduate programmes.

Majority of the staff in the Faculty of Agriculture earned their M.Sc.s and Ph.Ds between 1980 and 1985. They have little experience in teaching prior to their post graduate studies and no significant research experience except for their thesis work. On the contrary officers of DOA have been exposed to the research field atleast for 3 years before they enrol for graduate studies. We do not see this as a satisfactory or fair situation. To supervise thesis research, the supervisor must be an experienced researcher as well as a good teacher. Therefore it is evident that the best PGIA staff can offer at this stage is more of class room type teaching and not the proper research training that is required by the officers of the DOA. This is why majority of those who obtained post graduate training from PGIA opted to undergo course work M.Sc. instead of research M.Sc.s or M.Phils.

Even for such an exercise, PGIA is not fully equipped as they do not offer courses in many fields relevant to DOA officers. Even in fields in which PGIA claim that they are competent in providing training and got students enrolled on split programme basis, PGIA has already run into problems. For example, advanced courses on Statistics and Mathematics are not offered in PGIA and the Director (PGIA) has admitted this in his communication PGIA/administration/86/87 DARP dated 11.11.86 and PGIA/A/ACD/55 dated 22.1.87. As a result a scholar from DOA was asked to follow such courses in U.S.A., in addition to his initially approved course work plan.

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These facts show that the PGIA does neither have adequately experienced staff to provide high quality training, especially in research degrees nor it is organized to offer a wide range of courses.

## 5. Facilities at PGIA

### 5.1 Laboratories

In Director PGIA's paper he also admits that PGIA does not have its own laboratories, workshops or experimental stations. Laboratories of the Faculty of Agriculture with some improvements as it was claimed, are presently being used by PGIA. The labs of the Faculty of Agriculture are basically meant for training under graduates in experimental procedures but not equipped to cater to advanced research at post graduate level.

### 5.2 Computer Facilities

In his letter PGIA/A/ACD/55 dated 12.9.86, Director (PGIA), states that the few micro computers in PGIA are currently being fully utilized and the proposed new influx of students under the DARP split programme therefore will not have adequate computer facilities. In this letter, therefore, he has requested DARP to provide new micro computers to the PGIA.

### 5.3 Experimental Stations

PGIA does not have under her control any experimental stations. Under the proposed split programme for DOA officers, PGIA suggests that the students will conduct their field experiments in various Regional Research Centres of the DOA (letter of Director (PGIA), No. PGIA/A/ACD/55 dated 11.9.86). Then who provides other facilities like labour, capital equipment etc. for such research? PGIA has proposed DOA to provide such facilities. Then under whose supervision are these experiments conducted? PGIA has proposed Peradeniya based PGIA staff. Who pays travelling expenses and provide vehicles for PGIA staff to visit these sites? PGIA proposes DOA. What will be the net cost of this exercise? Wouldn't it be much more expensive exercise than initially claimed making it attractive to train DOA officers locally?

This is a also very clear example of how PGIA is trying to thrive on other's resources. The question here is why should DOA deploy her resources to favour PGIA and not mediocre products in region?

### 5.4 Library facilities

Here again Director/PGIA admits that PGIA does not have its own library but uses the library of the Faculty of Agriculture with some improvements. All these "improvements" come through the USAID programme which expired in late 1986. However, even with these improvements we still find that the library facilities at PGIA are extremely inadequate.

PGIA is prepared to offer high degrees in about 10 disciplines. There are many fields of specialization under each of these disciplines.

For all that PGIA has only 25,000 books, 165 journals and 1200 microfiches as at 1985 (Director/PGIA 1986). The book section may be barely acceptable, but this is important only for course work rather than

for research. The available collection of 165 journals PGIA is claimed to own is by no means acceptable to provide students with a fair degree of access to research findings published in the world. It is very important to note that even this set of journals is not complete as many of the periodicals are not serially continuous. Out of 53 key journals from 5 disciplines relevant to the DOA, about which we investigated in the PGIA library, 21 were not found. Only fifteen journals had volumes upto 1986 but seldom before 1975. There were other journals that were discontinued in 1983.

The inadequacy of PGIA library, on the other hand is reflected from the fact that it is one of the heavy users of the inter library loan facility at the library of the Central Agricultural Research Institute (CARI) of the DOA. Director/PGIA (1986) has claimed that the PGIA library is having computerized inter library links, which is far from the truth. In Peradeniya only the C.A.R.I. library has this facility and PGIA comes to the former for retrospective searches.

The above makes it very clear that PGIA does not possess necessary laboratory, computer, experimental field or library facilities to train graduate students up to the standards expected in the latter part of the 20th century. If the officers of DOA are forced into PGIA for their training under such circumstances, there is no doubt that DOA will become a technically incompetent and backward weakling in the fields of agricultural research and development.

#### 6. Strategy of the PGIA and the response of DOA

The facts presented above reveals that PGIA is an organization without adequate expertise, laboratory, computer and field experimentation facilities and library facilities though fallacious claims have been made by the Director (PGIA) to have all of these. After the expiration of USAED support in 1986, now it is also in a crisis due to drying up of financial resources.

We also showed that the past achievements of PGIA are not at all impressive to win a reputation as good centre for graduate studies. In this crisis the measure of survival adopted by the PGIA management is lobbying various national organizations and their international aid donors to establish administrative rigidities such that the officers of these organizations are compulsorily channelled to PGIA for post-graduate training.

In this attempt, what the PGIA management has presented as the beneficial factor is the low cost of training compared to foreign training. What was hidden is the extremely lacking capacity, extra long durations taken for completing studies which we described above and the resulting poor quality of the products. Apparently DOA and the donor agency of DARP (USAID) have concentrated only on the financial savings resulting from adopting the split programme policy, but have not paid serious attention to the quality of training obtained. Even presented financial advantage may not be possible with the present problems arising due to lack of facilities at PGIA.

Under the split programme, a masters degree candidate has to complete one year in U.S.A. following courses and one year in Sri Lanka conducting thesis research. The year in U.S.A. costs approximately US \$ 21,000 and

if he is allowed to continue studies there for another year and complete his degree, the total cost will be roughly US \$ 35,000. Thus with the cost of training 2 persons full time abroad, 3 persons can be trained under the split programme. The choice is between having 2 well trained officers and having 3 part qualification holders.

Expressing in more technical terms, has any consideration been given to the "intangible social cost" of losing technical competence of the officers with the petty "financial benefit" of the split programme.

We assert that the loss of productivity, due to inferior training and the resulting social cost, is much higher than any financial saving possible.

7. Effects of the split programme on the motivation of DOA officers

We all know that the salaries in the public service have been always less than in private sector and in state corporations. Yet there was a heavy demand for posts in Sri Lanka Agricultural Service, Scientific Service and institutions like TRI, RRI and CRI among the young graduate purely due to the scope in these for higher studies in reputed universities.

Everybody's ambition is to acquire sound qualifications that will help them at later stages in their carrier to stand on their own feet as recognized professionals. This boosts their self esteem, emotional wellbeing and at later stages of lives help gaining some financial benefits. Also as everyone openly admits, it is part of the dream to save some money in the period of study abroad to acquire some material benefits, which the salary in the public service will never warrant them to have.

It is these prospects that lead young graduates to join DOA sacrificing higher earning opportunities elsewhere. We pointed out earlier that during the past 10 years the hopes of the officers in DOA were being gradually stifled by inconsistent "scholarship policies". The ultimate shattering of the dream has come about with the present split programme policy. For the young graduates who are passing out now, there are no prospects in DOA. The cream of new graduates will go for greener pastures elsewhere and only those with no alternatives will join DOA. The oldest and most prestigious organization in the field of Sri Lankan agriculture will consequently be reduced to an idle machine in another 10 years time. Does PGIA or any other organization have the ability, organizational framework or the infrastructure to take DOA's place when this happens?

The other demoralizing factor is the non adoption of such measures as split programmes by many other important institutes like TRI, RRI and CRI. Even the university does not train its own staff at PGIA.

Another important issue is the complications introduced to the DOAs already incoherent "scholarship policy" by the adoption of the split programme. The split programme was imposed on DOA by DARP project as a result of strong canvassing done by PGIA management at USAID and DOA. However, PGIA admits that in some cases, the "half time abroad - half time in Sri Lanka" principle has to be waived and more time abroad has to be allowed as it can not offer some courses (letter No. PGIA/Administration/86/87 (DARP) dated 11.11.86). Some officers have

also been sent abroad for fulltime studies under some other projects funded by other agencies. At the same time officers obtaining training under DARP are forced to enrol for non degree programmes in foreign universities so that they will not be able to continue studies there even if they find financial assistance from sources other than DARP or DOA. This has created an atmosphere which is characterized by unequal opportunities and possibly with differential treatment in DOA, giving rise to extreme unrest among officers.

Another anomaly that aggravates this situation of differential opportunities is the absence of any living allowance to DARP trainees during their period of study in Sri Lanka. Only an allowance of US \$ 90 is proposed exclusively for research expenses on reimbursement basis. During study leave officers are deprived of any additional financial benefit and also have no time to worry about them if they were to be successful in studies.

In addition to the financial aspect, the other major factor that saps the energy and enthusiasm of the scholars under the split programme is the unbearable work load demanded by PGIA, in order to compensate for the void in the degree programmes created by the lack of facilities. In a memo entitled "Research of DARP Scholars" dated 15.7.1986, Director of PGIA instructs scholars to identify research problems and prepare a draft proposal before they leave the country to start on course work. This is highly unfair since students prepare their research proposals after they follow the courses, in the universities world over. Also this memo instructs the students to use library facilities in U.S.A. to prepare their research proposals while following courses. Anybody who has followed graduate studies will understand what a strain this could impose on a student. Moreover, the students are also asked to do some preliminary laboratory and green house work while in U.S.A. to "refine the methodology". The latter two demands not only over-burden the students but also reflects the inadequacy of library and laboratory facilities available at PGIA.

There are several projects in DOA with funds available for post graduate training and there are more such projects to come, including the World Bank Agricultural Research Project. It is clear what kind of pressure will be applied by PGIA while it is not clear what policies would be adopted by DOA, in relation to these projects. In view of this situation we feel an extremely urgent need to have a well delineated scholarship policy established in DOA, that is resistant to influences by PGIA and most importantly a policy that does justice to officers in DOA.

#### 8. Recommendations

The foundation of our proposals is the fact that what matters most from both personal and national view points is the technical competence and the morale of the officers. Bearing this and the facts we presented in this document we propose the following measures should be adopted by DOA regarding training of its officers at post-graduate level.

1. DOA should formulate a well articulate policy providing a logically and humanely justifiable basis regarding granting post graduate scholarships to its officers. We feel that seniority should be the primary factor. This policy should be open to the knowledge of all officers.

2. The policy should be a general one that does not change from project to project and thus avoid any possibility for unequal opportunities, deprivation and possible differential treatment.
3. DOA policy should not give way to funding agencies trying to force split programmes and persuade them that such practices have adverse effects on DOA.
4. Split programmes are to be considered as only one way of obtaining post graduate training but not as compulsory condition under any circumstances. If the officers concerned are willing to accept such a programme they can be allowed to do so. However, an adequate stipend should be paid during their in country training.
5. Whenever officers find financial support from open scholarships, assistantships etc., they should be allowed to pursue their studies in any part of the world, until completion.
6. At least one full time post graduate training in a developed country should be awarded to every officer.
7. PGIA should not be considered as a compulsory components of the post graduate training programmes of DOA. PGIA should be allowed to compete with rest of the universities and win its place in the accademic circles and attract students on its own reputation. DOA should not take any action to channel its officers into PGIA using administrative pressure.
8. Whenever split programmes are undertaken, DOA policy should be to encourage the officers to follow course work overseas and thesis research in Sri Lanka with the registration in an internationally recognized university for the award of the degree. We are happy that D.D.A (R) in his letter No R/T/62-4 dated 10.7.1986 has suggested similar measures to be adopted by DOA.
9. DOA should accept training of its staff as the major component in developing itself and should make continuous efforts to find funds for this purpose. Lack of funds should not be put forward a reason to force officers in to a place that provide low quality training.

AGRICULTURAL GRADUATES' ASSOCIATION  
DEPARTMENT OF AGRICULTURE

14th August, 1987

(time interview begun: \_\_\_\_\_ time interview completed: \_\_\_\_\_ )

APPENDIX X

DIVERSIFIED AGRICULTURAL RESEARCH PROJECT: BASELINE STUDY  
(PRODUCTION, ECONOMICS, AND EXTENSION)

I. FARM IDENTIFICATION AND LOCATION

- 1. Name of Farmer: \_\_\_\_\_
- 2. Date of Interview: \_\_\_\_\_
- 3. Household Size: \_\_\_\_\_
- 4. Village: \_\_\_\_\_
- 5. Address: \_\_\_\_\_
- 6. Interviewer: \_\_\_\_\_
- 7. Checking Supervisor: \_\_\_\_\_
- 8. Date Checked: \_\_\_\_\_
- 9. CO Range: \_\_\_\_\_
- 10. ASC Range: \_\_\_\_\_
- 11. District: \_\_\_\_\_

(for office entry: Agro-ecological Zone \_\_\_\_\_)



1.2

M A H A '85-86

Type of Field Crop, "Perennial", "Mixed" or, "Idle"	Crop Code	Extent & Unit Code	If Mixed, List Crops in Order of Importance (if any)				Tenure Code
l	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
o	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
w	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
l	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
a	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
n	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
d	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
h	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
i	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
g	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
h	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
l	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
a	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
n	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
d	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
c	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
h	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
e	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
n	_____	:____: :____: :____:	_____	_____	_____	_____	:____:
a	_____	:____: :____: :____:	_____	_____	_____	_____	:____:

Land Type

If lands were "Idle", note reasons: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

2.1 What was the total farm extent (farmed and idle) under the control of the respondent in YALA 1985? (INCLUDE LAND LEASED OR RENTED IN AND EXCLUDE LAND LEASED OR RENTED OUT)

YALA 1985

LOWLAND ( Extent and Coded Unit )	HIGHLAND	CHENA
:____: :____: :____:	:____: :____: :____:	:____: :____: :____:

(Yala General Farm & Cropping Intensity Continued Next Page)

CODES

CROPS: Chilli=1; Red Onion=2; Cowpea=3; Greengram=4; Blackgram=5; Soybean=6; Groundnut=7; Bombay Onion=8; Manioc=9; Maize=10; Kurakkan=11; Gingelly=12; Mixed Stand=13; Paddy=14; Vegetable=15; Coconut=16; Castor=17; Sugar Cane=18; Tea=19; Rubber=20; Cotton=21; Tobacco=22; Potato=23; Sweet Potato=25; Other (list) \_\_\_\_=00.

AREA CODES: Acre=1; Laas=2; Pal=3; Anunu=4; Kuruni=5; Bushel=6; Lachcham=7; Perch=8; Rode=9; Seru=10; Nai=11; Ali=12; Other (list) \_\_\_\_=00; Not known=99.

LAND TENURE: Owned=1; Rented=2; Encroached=3; LDO=4; Crown Land=5; Mortgage=6; Other(list) \_\_\_\_=00.

LAND TYPES: Highland=HL; Lowland=LL; Chena=CH.

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Type of  
Field Crop,  
"Perennial",  
"Mixed" or  
"Idle"

Crop  
Code      Extent &  
            Unit Code

If Mixed, List Crops  
in Order of Importance (if any)

Tenure  
Code

Type of Field Crop	Crop Code	Extent & Unit Code	If Mixed, List Crops in Order of Importance (if any)				Tenure Code
Lowland	_____	_____: _____	_____	_____	_____	_____	_____
Highland	_____	_____: _____	_____	_____	_____	_____	_____
Chena	_____	_____: _____	_____	_____	_____	_____	_____

If lands were "Idle", note reasons: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

CODES

CROPS: Chilli=1; Red Onion=2; Cowpea=3; Greengram=4; Blackgram=5; Soyabean=6; Groundnut=7; Bombay Onion=8; Manioc=9; Maize=10;  
 Kurakkan=11; Gingelly=12; Mixed Stand=13; Paddy=14; Vegetable=15; Coconut=16; Castor=17; Sugar Cane=18; Tea=19;  
 Rubber=20; Cotton=21; Tobacco=22; Potato=23; Sweet Potato=25; Other (list) \_\_\_\_\_=00.

AREA CODES: Acre=1; Laas=2; Pal=3; Amunu=4; Kuruni=5; Bushel=6; Lachchan=7; Perch=8; Rode=9; Seru=10; Nal=11; Ali=12;  
 Other (list) \_\_\_\_\_=00; Not known=99.

LAND TENURE: Owned=1; Rented=2; Encroached=3; LDO=4; Crown Land=5; Mortgage=6; Other (list) \_\_\_\_\_=00.

LAND TYPES: Highland=HL; Lowland=LL; Chena=CH.

IV.A. CROP OF FOCUS - COST OF CULTIVATION AND PRODUCTION TECHNOLOGIES

1.1 Crop \_\_\_\_\_ Crop Code :\_\_\_\_: Extent&Unit :\_\_\_\_:\_\_\_\_:  
 Land Type (coded) :\_\_\_\_: Water Source (coded) :\_\_\_\_:\_\_\_\_:  
 (LL, HL, CH) (IR, RF, RFI)

1.2. Did you prepare nursery for this crop? yes no  
 (If the answer is yes go to section 1.3, if no go to section 1.4)

1.3. Nursery Material Costs:

	Seed1	Seed2 (if another)
Amount of Seed Used (coded unit)	:____:____:	:____:____:
Price per Unit (coded unit)	:____:____:	:____:____:
Improved=1 or Traditional=2 Seed:	:____:____:	:____:____:
Seed Variety (coded):	_____	_____
Source (code):	_____	_____
If own seed, last year of replacement:	_____	_____
Estimated Percentage of Seed Germination:	_____	_____
Estimated Seed Loss, if any, to Animals :	_____	_____

Use of fertilizer in nursery? yes no  
 :\_\_\_\_: :\_\_\_\_:

If yes:

	type :	unit :	total :	source :
Fertilizer :	name :	(code):	qnty :	(code):
cost :	(code):			
first	:	:	:	:
second	:	:	:	:
third	:	:	:	:

(Nursery Agrochemical Information Continued Next Page)

CODES

FERTILIZER: V1=1; NPK=2; Urea=3; TDM=4; Chilli Mixture=5; Potato Mixture=6; Onion Mixture=7; Amonium Sulphate=8; Murrate of Potash=9; Super Phosphate=10; Green Manure=11; Compost=12; Animal Manure=13; Nitrogen 5=14; Other (list) \_\_\_=20; Not known=99.

QUANTITIES: Units=1; Ounces=2; Lbs=3; Cwt=4; Kgs=5; Bushels=6; Gallons=7; Pints=8; Litres=9; Fluid Ounces=10; ml=11; Grams=12; Cartload=13; Lorryload=14; Other (list) \_\_\_=20.

SOURCES AND OUTLETS OF: Co-op=1; Agrarian Services Centre=2; Paddy Marketing Board=3; Other Government Institutes=4; Private Dealers=5; Neighbors=6; Fertilizer Store=7; Own=8; Village-pola=9; Other(list) \_\_\_=20.

AREA CODES: Acre=1; Laas=2; Pal=3; Amunu=4; Kuruni=5; Bushel=6; Lachcham=7; Perch=8; Rode=9; Seru=10; Nal=11; Ali=12; Other (list) \_\_\_=00; Not known=99.

CROPS: Chilli=1; Red Onion=2; Compea=3; Greengram=4; Blackgram=5; Soyabean=6; Groundnut=7; Boubay Onion=8; Mantoc=9; Maize=10; Kurakkan=11; Gingelly=12; Mixed Stand=13; Paddy=14; Vegetable=15; Coconut=16; Castor=17; Sugar Care=18; Tea=19; Rubber=20; Cotton=21; Tobacco=22; Potato=23; Sweet Potato=25; Other (list) \_\_\_=00.





1.4.4 Use of any other material inputs in main field? : \_\_\_ : \_\_\_ :

If yes:

Type	qnty	unit	total	source
		(code)	cost	(code)
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----

1.5

LABOR REQUIREMENTS FOR CROP OF FOCUS

ACTIVITY	avg	FAM&ATTN LBR			H I R E D L A B O R				
	hrs/	M	F	C	M	F	C		
	day/			d	w&m	d	w&m	d	w&m
	actv				per		per		per
					day		day		day
Nursery:	-----	-----	-----	-----	-----	-----	-----	-----	-----
:nursery preparation	-----	-----	-----	-----	-----	-----	-----	-----	-----
:	-----	-----	-----	-----	-----	-----	-----	-----	-----
:plant establishment	-----	-----	-----	-----	-----	-----	-----	-----	-----
:	-----	-----	-----	-----	-----	-----	-----	-----	-----
:fertilizing	-----	-----	-----	-----	-----	-----	-----	-----	-----
:	-----	-----	-----	-----	-----	-----	-----	-----	-----
:manual weeding	-----	-----	-----	-----	-----	-----	-----	-----	-----
:	-----	-----	-----	-----	-----	-----	-----	-----	-----
:chemical weeding	-----	-----	-----	-----	-----	-----	-----	-----	-----
:	-----	-----	-----	-----	-----	-----	-----	-----	-----
:insect control	-----	-----	-----	-----	-----	-----	-----	-----	-----
:	-----	-----	-----	-----	-----	-----	-----	-----	-----
:other _____	-----	-----	-----	-----	-----	-----	-----	-----	-----
Clearing/Burning	-----	-----	-----	-----	-----	-----	-----	-----	-----

(Labor Requirements Continued Next Page)

CODES

QUANTITIES: Units=1; Ounces=2; Lbs=3; Cwt=4; Kgs=5; Bushels=6; Gallons=7; Pints=8; Litres=9; Fluid Ounces=10; ml=11; Grams=12; Cartload=13; Lorryload=14; Other (list) \_\_\_=00.

SOURCES AND OUTLETS OF: Co-op=1; Agrarian Services Centre=2; Paddy Marketing Board=3; Other Government Institutes=4; Private Dealers=5; Neighbors=6; Fertilizer Stores=7; Own=8; Village-pola=9; Other(list) \_\_\_=00.



ACTIVITY	:avg :FAM&ATTN LBR      H I R E D   L A B O R								
	:hrs/ : M : F : C :			M :			F :		
	:day/ :			d :			d :		
	:actv: :			:/day:			:/day:		
Agrochemical									
: Application _____	£1:								
: (check against _____	2:								
: section 1.4.3) _____	3:								
: _____	4:								
: _____	5:								
: _____	6:								
: _____	7:								
: _____	8:								
: _____	9:								
: _____	10:								
: _____	11:								
: _____	12:								
Hand Watering .....									
Gravity Irrigating .....									
: _____ (code) _____									
: (machinery cost) _____									
Lift Irrigating .....									
: _____ (code) _____									
: _____									
: (machinery cost) _____									
Harvesting            No. 1:									
:                            2:									
:                            3:									
:                            4:									
:                            5:									
Threshing    (code) _____									
: _____									
: (machinery cost) _____									
Winnowing    (code) _____									
: _____									
: (machinery cost) _____									
Processing: _____									
: _____									
: _____									

(Labor Requirements Continued Next Page)

CODES

POWER SOURCES IN LAND PREP AND THRESHING: Manually=1; With own buffaloes=2; With own 2-W tractor=3; With own 4-W tractor=4; With hired buffaloes=5; With hired 2-W tractor=6; With hired 4-W tractor=7; Manually on contract=8; With buffaloes on contract=9; With 2-W tractor on contract=10; With 4-W tractor on contract=11; Thresher=12; Other(list)=0.

SOURCES IN IRRIGATION: Manually=1; With own buffaloes=2; With own water pump=3; With hired water pump=4; Gravity irrigation=5; Other(list)=0.

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1.6 Harvesting

(For our purposes, Single Harvesting means the harvest is done and completed at a single point in time. Multiple Harvesting means the harvest is done at more than one point in time before finishing.)

1.6.1 Single (s) or Multiple (m) Harvesting? :\_\_\_: If Multiple, go on to question 1.6.3

1.6.2 If Single,

Extent Harvested & Unit(coded): :\_\_\_:\_\_\_:

\*if extent harvested is less than extent planted, reason:\_\_\_\_\_

\*if crop damaged by pest or animal, name:\_\_\_\_\_

\*if damaged, estimated quantity loss of crop output & unit :\_\_\_:\_\_\_:  
(coded)

Amount of Harvest & Unit (coded): :\_\_\_:\_\_\_:

Nature of Produce (coded) :\_\_\_:

1.6.3 If Multiple,

Extent Harvested & Unit(coded): :\_\_\_:\_\_\_:

\*if extent harvested is less than extent planted, reason:\_\_\_\_\_

\*if crop damaged by pest or animal, name:\_\_\_\_\_

\*if damaged, estimated quantity loss of crop output & unit :\_\_\_:\_\_\_:  
(coded)

Number of the harvest:	Quantity & Unit (coded)	Nature of the Product (coded)
----	:___:___:	-----
----	:___:___:	-----
----	:___:___:	-----
----	:___:___:	-----
----	:___:___:	-----
----	:___:___:	-----
----	:___:___:	-----
----	:___:___:	-----

(Marketing Next Page)

CODES

QUANTITIES: Units=1; Ounces=2; Lbs=3; Cwt=4; Kgs=5; Bushels=6; Gallons=7; Pints=8; Litres=9; Fluid Ounces=10; ml=11; Grams=12; Cartload=13; Lorryload=14; Other (list) \_\_\_=0.

AREA CODES: Acre=1; Laas=2; Pal=3; Aunu=4; Kuruni=5; Bushel=6; Lacham=7; Perch=8; Rode=9; Seru=10; Nal=11; Ali=12; Other (list) \_\_\_=0; Not known=99.

NATURE OF PRODUCE: Seed (grain)=1; Raw Cob=2; Mature Cob=3; Green Chilli=4; Ripe Chilli=5; Dried Chilli=6; Spring Onion=7; Onion Bulbs=8; Tubers=9; Pods=10; Other(list) \_\_\_=0.

1.7.1 Crop Uses:

Method of Disposal	Nature of the Produce (coded)	Quantity & Unit (coded)		
:given to landlord	:_____	:____:____		
:	:_____	:____:____		
:	:_____	:____:____		
:	:_____	:____:____		
:given to settle loans	:_____	:____:____		
:	:_____	:____:____		
:	:_____	:____:____		
:	:_____	:____:____		
:retained for seed	:_____	:____:____		
:	:_____	:____:____		
:already consumed	:_____	:____:____		
:	:_____	:____:____		
:	:_____	:____:____		
:retained for future consumption or sale	:_____	:____:____		
:	:_____	:____:____		
:	:_____	:____:____		
:estimate of quantity yet to be harvested	:_____	:____:____		
:	:_____	:____:____		
:other use _____	:_____	:____:____		
:(specify) _____	:_____	:____:____		
:	:_____	:____:____		
:	:_____	:____:____		
:	:_____	:____:____		
:SOLD:	type of sales outlet (coded)	nature of produce (coded)	quantity & unit (coded)	price per unit (coded)
:	:_____	:_____	:____:____	:____:____
:	:_____	:_____	:____:____	:____:____
:	:_____	:_____	:____:____	:____:____
:	:_____	:_____	:____:____	:____:____
:	:_____	:_____	:____:____	:____:____

CODES

- NATURE OF PRODUCE: Seed (grain)=1; Raw Cob=2; Mature Cob=3; Green Chilli=4; Ripe Chilli=5; Dried Chilli=6; Spring Onion=7; Onion Bulbs=8; Tubers=9; Pods=10; Other (list)\_\_\_\_=08.
- QUANTITIES: Units=1; Cans=2; Lbs=3; Cwt=4; Kgs=5; Bushels=6; Gallons=7; Pints=8; Litres=9; Fluid Ounces=10; Sl=11; Grams=12; Cartons=13; Long Tons=14; Other (list)\_\_\_\_=22.
- SOURCES AND PLACES OF: Cooper=1; Agrarian Services Centre=2; Paddy Marketing Board=3; Other Government Institutes=4; Private Dealers=5; Neighbors=6; Fertilizer Stores=7; Own=8; Village-pola=8 Other(list)\_\_\_\_=20.



	CROP 1	CROP 2	CROP 3	CROP 4	CROP 5
Estimated Percentage:	-----	-----	-----	-----	-----
of Seed Germination:	----- %	----- %	----- %	----- %	----- %
of Plant Survival	-----	-----	-----	-----	-----
Past 3 Weeks.....:	----- %	----- %	----- %	----- %	----- %

1.3. Did you prepare nursery for any of the crops in this stand?

YES NO  
:\_\_\_: :\_\_\_:

(If the answer is no go to question 1.5)

If yes, which crops? \_\_\_\_\_ (go on to section 1.4)

1.4. Nursery Material Costs:

1.4.1. Nursery Material Costs for: CROP 1 \_\_\_\_\_  
(name)

Use of fertilizer in nursery? YES NO  
:\_\_\_: :\_\_\_:

If yes:

	type :	unit :	total :	source :
Fertilizer :	name :	(code):	qty : (code):	cost : (code):
:	_____:	_____:	_____:	_____:
:	_____:	_____:	_____:	_____:
:	_____:	_____:	_____:	_____:

Use of agrochemicals in nursery? YES NO  
:\_\_\_: :\_\_\_:

If yes:

	Appl:	Type:	:	unit :	total :	source :	*apply:	operating:
	_____:	_____:	_____:	_____:	_____:	_____:	_____:	_____:
	_____:	_____:	_____:	_____:	_____:	_____:	_____:	_____:
	_____:	_____:	_____:	_____:	_____:	_____:	_____:	_____:

\*application method: 1-own manual sprayer, 2-hired manual sprayer,  
3-own power sprayer, 4-hired power sprayer,  
5-manual application without sprayer

(Nursery Material Costs for Crop 2 Next Page)

CODES

FERTILIZERS: V1=1; NP=2; Urea=3; TDY=4; Ch11; Mixture=5; Potato Mixture=6; Onion Mixture=7; Ammonium Sulphate=8; Muriate of Potash=9; Super Phosphate=10; Green Manure=11; Compost=12; Animal Manure=13; Nitrogen S=14; Other (list) \_\_\_\_=22; Not known=99.

QUANTITIES: Units=1; Dunces=2; Lbs=3; Cwt=4; Kgs=5; Bushels=6; Gallons=7; Pints=8; Litres=9; Fluid Dunces=10; ml=11; Grams=12; Cartload=13; Lorryload=14; Other (list) \_\_\_\_=23.

SOURCES AND OUTLETS OF: Co-op=1; Agrarian Services Centre=2; Paddy Marketing Board=3; Other Government Institutes=4; Private Dealers=5; Neighbors=6; Fertilizer Stores=7; Own=8; Village pola=9; Other(list) \_\_\_\_=24.

AGROCHEMICAL TYPES: Herbicide=1; Insecticide=2; Fungicide=3; Other (list) \_\_\_\_=25.

1.4.2. Nursery Material Costs for: CROP 2 \_\_\_\_\_  
(name)

Use of fertilizer in nursery?      yes      no  
   :\_\_\_:      :\_\_\_:

If yes:

Fertilizer	name	(code)	qty	(code)	cost	(code)	source
:	_____	_____	_____	_____	_____	_____	_____
:	_____	_____	_____	_____	_____	_____	_____
:	_____	_____	_____	_____	_____	_____	_____

Use of agrochemicals in nursery?      yes      no  
   :\_\_\_:      :\_\_\_:

If yes:

Appl.Type.	_____	unit	total	source	*apply	operating		
£	code	Name	qty	(code)	cost	(code)	(code)	costs
:	_____	_____	_____	_____	_____	_____	_____	_____
:	_____	_____	_____	_____	_____	_____	_____	_____
:	_____	_____	_____	_____	_____	_____	_____	_____

\*application method: 1-own manual sprayer, 2-hired manual sprayer, 3-own power sprayer, 4-hired power sprayer, 5-manual application without sprayer

(Main Field Cultivation Next Page)

-----  
CODES

- FERTILIZER: VI=1; NPK=2; Urea=3; TDM=4; Chilli Mixture=5; Potato Mixture=6; Onion Mixture=7; Amonium Sulphate=8; Murrate of Potash=9; Super Phosphate=10; Green Manure=11; Compost=12; Animal Manure=13; Nitrogen S=14; Other (list) \_\_\_=00; Not known=99.
- QUANTITIES: Units=1; Ounces=2; Lbs=3; Cwt=4; Kgs=5; Bushels=6; Gallons=7; Pints=8; Litres=9; Fluid Ounces=10; ml=11; Grams=12; Cartload=13; Lorryload=14; Other (list) \_\_\_=00.
- SOURCES AND OUTLETS OF: Co-op=1; Agrarian Services Centre=2; Paddy Marketing Board=3; Other Government Institutes=4; Private Dealers=5; Neighbors=6; Fertilizer Stores=7; Own=8; Village pola=9; Other (list) \_\_\_=00.
- AGROCHEMICAL TYPES: Herbicide=1; Insecticide=2; Fungicide=3; Other (list) \_\_\_=00.

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1.5. Main Field Material Costs

1.5.1 Use of fertilizer in main field? yes no  
:\_\_\_: :\_\_\_:

If yes:

Fertilizer	name	type	unit	total	transport	source
£	1	2	3	4	5	6
1	:	:	:	:	:	:
2	:	:	:	:	:	:
3	:	:	:	:	:	:
4	:	:	:	:	:	:

1.5.2 Use of agrochemicals in main field? yes no  
:\_\_\_: :\_\_\_:

If yes:

Apply:	Type:	unit	total	source	*apply	operating		
£	Name	code	qnty	(code)	cost	(code)	(code)	costs
:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:

\*application method: 1-own manual sprayer, 2-hired manual sprayer, 3-own power sprayer, 4-hired power sprayer, 5-manual application without sprayer

(Use of Other Material Inputs Next Page)

CODES

FERTILIZER: V1=1; NPK=2; Urea=3; TDY=4; Chilli Mixture=5; Potato Mixture=6; Onion Mixture=7; Amonium Sulphate=8; Murrate of Potash=9; Super Phosphate=10; Green Manure=11; Compost=12; Animal Manure=13; Nitrogen S=14; Other (list) \_\_\_=22; Not known=99.

QUANTITIES: Units=1; Durces=2; Lbs=3; Cwt=4; Kgs=5; Bushels=6; Gallons=7; Pints=8; Litres=9; Fluid Ounces=10; ml=11; Grams=12; Cartload=13; Lorryload=14; Other (list) \_\_\_=22.

SOURCES AND OUTLETS OF: Co-op=1; Agrarian Services Centre=2; Paddy Marketing Board=3; Other Government Institutes=4; Private Dealers=5; Neighbors=6; Fertilizer Stores=7; Own=8; Village pola=9; Other(list) \_\_\_=22.

AGROCHEMICAL TYPES: Herbicide=1; Insecticide=2; Fungicide=3; Other (list) \_\_\_=22.

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1.5.3 Use of any other material inputs in main field? yes no  
 :\_\_\_: :\_\_\_:

If yes:

Type	qty	unit	total	cost
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----

1.6

LABOR REQUIREMENTS FOR MIXED STAND

ACTIVITY	:avg :FAM&ATTN LABOR :			H I R E D L A B O R			
	:hrs/:	M : F : C :	d	M	F	C	
	:day/:			:w&m	:d	:w&m	
	:actv:			:per		:per	
	:_____:	:_____:	:_____:	:day	:_____:	:day	
Nursery CROP1:							
:nursery preparation	:___:	:___:	:___:	:___:	:___:	:___:	:___:
:	-----	-----	-----	-----	-----	-----	-----
:plant establishment	:___:	:___:	:___:	:___:	:___:	:___:	:___:
:	-----	-----	-----	-----	-----	-----	-----
:fertilizing	:___:	:___:	:___:	:___:	:___:	:___:	:___:
:	-----	-----	-----	-----	-----	-----	-----
:manual weeding	:___:	:___:	:___:	:___:	:___:	:___:	:___:
:	-----	-----	-----	-----	-----	-----	-----
:chemical weeding	:___:	:___:	:___:	:___:	:___:	:___:	:___:
:	-----	-----	-----	-----	-----	-----	-----
:insect control	:___:	:___:	:___:	:___:	:___:	:___:	:___:
:	-----	-----	-----	-----	-----	-----	-----
:other_____	:___:	:___:	:___:	:___:	:___:	:___:	:___:
	-----	-----	-----	-----	-----	-----	-----
Nursery CROP2:							
:nursery preparation	:___:	:___:	:___:	:___:	:___:	:___:	:___:
:	-----	-----	-----	-----	-----	-----	-----
:plant establishment	:___:	:___:	:___:	:___:	:___:	:___:	:___:
:	-----	-----	-----	-----	-----	-----	-----
:fertilizing	:___:	:___:	:___:	:___:	:___:	:___:	:___:
:	-----	-----	-----	-----	-----	-----	-----
:manual weeding	:___:	:___:	:___:	:___:	:___:	:___:	:___:
:	-----	-----	-----	-----	-----	-----	-----
:chemical weeding	:___:	:___:	:___:	:___:	:___:	:___:	:___:
:	-----	-----	-----	-----	-----	-----	-----
:insect control	:___:	:___:	:___:	:___:	:___:	:___:	:___:
:	-----	-----	-----	-----	-----	-----	-----
:other_____	:___:	:___:	:___:	:___:	:___:	:___:	:___:
	-----	-----	-----	-----	-----	-----	-----

CODES

QUANTITIES: Units=1; Ounces=2; Lbs=3; Cwt=4; Kgs=5; Bushels=6; Gallons=7; Pints=8; Litres=9; Fluid Ounces=10; ml=11; Grams=12; Cartload=13; Lorryload=14; Other (list)\_\_\_=00.

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ACTIVITY	:avg :FAM&ATTN LABOR : H I R E D L A B O R												
	:hrs/ : M : F : C :			M : F : C :			:day/ : : : d :w&m : d :w&m : d :w&m :			:actv : : : : /day : /day : /day :			
	Clearing/Burning	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
	Land Preparation	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
:1st plough (code) _____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	
: _____ (cost) _____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	
: _____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	
:2nd plough (code) _____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	
: _____ (cost) _____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	
: _____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	
:harrowing (code) _____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	
: _____ (cost) _____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	
: _____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	
:prep of beds & ridges _____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	
: _____ (code) _____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	
: _____ (cost) _____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	

(Planting No. 'x' is by ACTIVITY, NOT by CROP, i.e. several crops planted at the same time means one planting for labor analysis)

Prep of Planting Holes/	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Sowing/Planting No. 1	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Prep of Planting Holes/	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Sowing/Planting No. 2	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Prep of Planting Holes/	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Sowing/Planting No. 3	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Prep of Planting Holes/	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Sowing/Planting No. 4	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Filling Vacancies	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
:	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____

(Labor Requirements Continued Next Page)

CODES

CWER SOURCES IN LAND PREP AND THRESHING: Manually=1; With own buffaloes=2; With own 2-W tractor=3; With own 4-W tractor=4; With hired buffaloes=5; With hired 2-W tractor=6; With hired 4-W tractor=7; Manually on contract=8; With buffaloes on contract=9; With 2-W tractor on contract=10; With 4-W tractor on contract=11; Thresher=12; Other(list)=00.

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ACTIVITY	:avg :FAM&ATTN LABOR :			H I R E D L A B O R		
	:hrs/:	M : F : C :	M : F : C :	d :w&m :	d :w&m :	d :w&m :
	:day/:	:	:	:/day:	:/day:	:/day:
	:actv:	:	:	:	:	:
Fertilizing: Apply ___£1:	_____	_____	_____	_____	_____	_____
:(check against _____2:	_____	_____	_____	_____	_____	_____
: section 1.4. ) _____3:	_____	_____	_____	_____	_____	_____
:	_____4:	_____	_____	_____	_____	_____
:	_____5:	_____	_____	_____	_____	_____
Manual Weeding and Earthing/Loosening Up	1: _____	_____	_____	_____	_____	_____
: Soil	2: _____	_____	_____	_____	_____	_____
	3: _____	_____	_____	_____	_____	_____
Agrochemical						
: Application _____£1:	_____	_____	_____	_____	_____	_____
:(check against _____2:	_____	_____	_____	_____	_____	_____
: section 1.4. ) _____3:	_____	_____	_____	_____	_____	_____
:	_____4:	_____	_____	_____	_____	_____
:	_____5:	_____	_____	_____	_____	_____
Hand Watering	:	_____	_____	_____	_____	_____
Gravity Irrigating.....	:	_____	_____	_____	_____	_____
:(code) _____	:	_____	_____	_____	_____	_____
:(cost) _____	:	_____	_____	_____	_____	_____
Lift Irrigating.....	:	_____	_____	_____	_____	_____
:(code) _____	:	_____	_____	_____	_____	_____
:(cost) _____	:	_____	_____	_____	_____	_____

(The remaining Labor Analyses are by ACTIVITY, NOT by CROP, i.e. an activity undertaken for several crops at the same time means a single activity for labor analysis)

Harvesting	No.	1:	2:	3:	4:	5:	6:	7:
:		_____	_____	_____	_____	_____	_____	_____
:		_____	_____	_____	_____	_____	_____	_____
:		_____	_____	_____	_____	_____	_____	_____
:		_____	_____	_____	_____	_____	_____	_____
:		_____	_____	_____	_____	_____	_____	_____
:		_____	_____	_____	_____	_____	_____	_____
:		_____	_____	_____	_____	_____	_____	_____

(Labor Requirements Continued Next Page)

CODES

POWER SOURCES IN LAND PREP AND THRESHING: Manually=1; With own buffaloes=2; With own 2-W tractor=3; With own 4-W tractor=4; With hired buffaloes=5; With hired 2-W tractor=6; With hired 4-W tractor=7; Manually on contract=8; With buffaloes on contract=9; With 2-W tractor on contract=10; With 4-W tractor on contract=11; Thresher=12; Other(list)=22.

SOURCES IN IRRIGATION: Manually=1; With own buffaloes=2; With own water pump=3; With hired water pump=4; Gravity irrigation=5; Other(list)=22.

ACTIVITY	:avg :FAM&ATTN LABOR : H I R E D L A B O R											
	:hrs/:			: M : F : C :			: M :			: F : C :		
	:day/:			: d :			:w&m :			: d :w&m :		
	:actv:			: :			:/day:			:/day:		
Thresh No.1 (code) _____	:	:	:	:	:	:	:	:	:	:	:	:
: (machinery cost) _____	:	:	:	:	:	:	:	:	:	:	:	:
Thresh No.2 (code) _____	:	:	:	:	:	:	:	:	:	:	:	:
: (machinery cost) _____	:	:	:	:	:	:	:	:	:	:	:	:
Thresh No.3 (code) _____	:	:	:	:	:	:	:	:	:	:	:	:
: (machinery cost) _____	:	:	:	:	:	:	:	:	:	:	:	:
Thresh No.4 (code) _____	:	:	:	:	:	:	:	:	:	:	:	:
: (machinery cost) _____	:	:	:	:	:	:	:	:	:	:	:	:
Winnow No.1 (code) _____	:	:	:	:	:	:	:	:	:	:	:	:
: (machinery cost) _____	:	:	:	:	:	:	:	:	:	:	:	:
Winnow No.2 (code) _____	:	:	:	:	:	:	:	:	:	:	:	:
: (machinery cost) _____	:	:	:	:	:	:	:	:	:	:	:	:
Winnow No.3 (code) _____	:	:	:	:	:	:	:	:	:	:	:	:
: (machinery cost) _____	:	:	:	:	:	:	:	:	:	:	:	:
Winnow No.4 (code) _____	:	:	:	:	:	:	:	:	:	:	:	:
: (machinery cost) _____	:	:	:	:	:	:	:	:	:	:	:	:
Processing: _____	:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:	:	:	:	:	:

(Labor Requirements in Transport Next Page)

CODES

POWER SOURCES IN LAND PREP AND THRESHING: Manually=1; With own buffaloes=2; With own 2-W tractor=3; With own 4-W tractor=4;  
 With hired buffaloes=5; With hired 2-W tractor=6; With hired 4-W tractor=7; Manually on contract=8;  
 With buffaloes on contract=9; With 2-W tractor on contract=10; With 4-W tractor on contract=11; Thresher=12; Other(1st)=20.

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1.7 Harvesting

1.7.1 Single (s) or Multiple (m) Harvesting? :\_\_\_: If Multiple, go on to question 1.7.3. If Single complete 1.7.2.

(If there is only one harvest for the whole plot, then it is a "Single" harvest. If there is more than one harvest for the whole plot, regardless of which crop is harvested how many times, then it is a "Multiple" harvest.)

1.7.2 If Single,

Extent Harvested & Unit (coded): :\_\_\_:\_\_\_:

\*if extent harvested is less than extent planted, reason:\_\_\_\_\_

\*if crop damaged by pest or animal, name:\_\_\_\_\_

\*if damaged, estimated value of loss. :\_\_\_:\_\_\_:

Single Harvest:

Crop	Crop	Nature of	Amount	Unit	Estimate of
:coded	:coded	Produce	Harvested	:(coded):	Price/unit (code)
		(coded)			in Locality
					at Harvest:
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

(Multiple Harvest Next Page)

CODES

AREA CODES: Acre=1; Laas=2; Pal=3; Anunu=4; Kuruni=5; Bushel=6; Lachcham=7; Perch=8; Rode=9; Seru=10; Nal=11; Ali=12; Other (list) \_\_\_=22; Not known=99.

CROPS: Chilli=1; Red Onion=2; Cowpea=3; Greengram=4; Blackgram=5; Soyabean=6; Groundnut=7; Bombay Onion=8; Manioc=9; Maize=10; Kurakkan=11; Gingelly=12; Mixed Stand=13; Paddy=14; Vegetable=15; Coconut=16; Castor=17; Sugar Cane=18; Tea=19; Rubber=20; Cotton=21; Tobacco=22; Potato=23; Sweet Potato=25; Other (list) \_\_\_=20.

QUANTITIES: Units=1; Dunces=2; Lbs=3; Cwt=4; Kgs=5; Bushels=6; Gallons=7; Pints=8; Litres=9; Fluid Ounces=10; ml=11; Grams=12; Cartload=13; Lorryload=14; Other (list) \_\_\_=00.

NATURE OF PRODUCE: Seed (grain)=1; Raw Cob=2; Mature Cob=3; Green Chilli=4; Ripe Chilli=5; Dried Chilli=6; Spring Onion=7; Onion Bulbs=8; Tubers=9; Pods=10; Other (list) \_\_\_=00.

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1.6 Marketing and Final Uses of Main Crop of Focus in the Stand  
 (The main crop(s) is defined strictly by the lead crop(s) for which the study is being undertaken, not by any other criteria)

1.6.1 Uses of main crop of focus in the stand:

Method of Disposal	Main Crop (only)	Nature of the Produce (coded)	Quantity & Unit (coded)
given to landlord	-----	-----	-----
given to settle loans	-----	-----	-----
retained for seed	-----	-----	-----
already consumed	-----	-----	-----
retained for future consumption or sale	-----	-----	-----
estimate of quantity yet to be harvested	-----	-----	-----
other use (specify)	-----	-----	-----

SOURCE	type of sales outlet (coded)	nature of produce (coded)	quantity & unit (coded)	price per unit (coded)
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----

CODES

QUANTITIES: Units=1; Dunces=2; Lbs=3; Cwt=4; Kgs=5; Bushels=6; Gallons=7; Pints=8; Litres=9; Fluid Dunces=10; nl=11; Grams=12; Cartload=13; Lorryload=14; Other (list) \_\_\_\_=20.

NATURE OF PRODUCE: Seed (grain)=1; Raw Cob=2; Mature Cob=3; Green Chilli=4; Ripe Chilli=5; Dried Chilli=6; Spring Onion=7; Onion Bulbs=8; Tubers=9; Pods=10; Other(list) \_\_\_\_=20.

SOURCES AND OUTLETS OF: Co-op=1; Agrarian Services Centre=2; Paddy Marketing Board=3; Other Government Institutes=4; Private Dealers=5; Neighbors=6; Fertilizer Stores=7; Own=8; Village pole=9; Other(list) \_\_\_\_=20.

1.8.2 Uses of other main crop of focus in the stand (if any):

Method of Disposal	Main Crop (only)	Nature of the Produce (coded)	Quantity & Unit (coded)
given to landlord			
given to settle loans			
retained for seed			
already consumed			
retained for future consumption or sale			
estimate of quantity yet to be harvested			
other use (specify)			

SOLD:	type of sales outlet (coded)	nature of produce (coded)	quantity & unit (coded)	price per unit (coded)

CODES

QUANTITIES: Units=1; Cunes=2; Lbs=3; Cwt=4; Kgs=5; Bushels=6; Gallons=7; Pints=8; Litres=9; Fluid Cunes=10; ml=11; Grams=12; Cartload=13; Lorryload=14; Other (list) \_\_\_\_=22.

NATURE OF PRODUCE: Seed (grain)=1; Raw Cob=2; Mature Cob=3; Green Chilli=4; Ripe Chilli=5; Dried Chilli=6; Spring Onion=7; Onion Bulbs=8; Tubers=9; Pods=10; Other (list) \_\_\_\_=22.

SOURCES AND OUTLETS OF: Co-op=1; Agrarian Services Centre=2; Paddy Marketing Board=3; Other Government Institutes=4; Private Dealers=5; Neighbors=6; Fertilizer Stores=7; Cwn=8; Village pola=9; Other (list) \_\_\_\_=22.



## APPENDIX XI

LONG-TERM SCHOLARS WHO HAVE COMMENCED TRAINING

Department/Division	Field	University	Period
Seed	Seed Technology	Mississippi State	Jan., '86/Dec., '87*
Research	Food Science	University of Illinois	Jan., '86/Dec., '87*
Research	Insect Tax.	University of Maryland	May '86/May '88
Seed	Seed Technology	Mississippi State	June '86/May '88
Extension	Agriculture Extn.	University of Illinois	June '86/May '88
Extension	Agronomy	Auburn University	June '86/May '88
Extension	Extn./Rural Soc.	University of Illinois	Aug., '86/Aug., '88****
Extension	Agric. Education	West Vir.	Aug., '86/July '88
Research	Plant Pathology	Rutgers University	Aug., '86/July '88*****
Research	Plant Breeding	University of Wisconsin	Aug., '86/July '88
Extension	Water Management	Colorado State	Aug., '86/July '88
Research	Stat. & Biom.	Rutgers University	Aug., '86/Dec. '88*****
Research	Entomology	Texas A&M	Aug., '86/July '89**
Extension	Water Management	Utah State	Sep., '86/Aug., '86
Economics	Agric. Economics	Oregon State	Sep., '86/Aug., '88
Economics	Agric. Economics	Oregon State	Sep., '86/Aug., '88
Research	Plant Pathology	Oregon State	Sep., '86/Aug., '89**
Education & Training	Crop Systems	PGIA/IRRI	Oct., '86/Oct., '88
Research	Weed Science	PGIA	Oct., '86/Oct., '88
Research	Entomology	New Mexico	Jan., '87/Dec., '88
Research	Weed Agronomics	UPLB	June '87/May '89
Seed	Seed Technology	Oregon State	Sep., '87/Aug., '89
Seed Certification	Seed Technology	Oregon State	Sep., '87/Aug., '89
Seed Certification	Seed Technology	Oregon State	Sep., '87/Aug., '89

\* Full-time U.S. M.Sc. programs; \*\* Ph.D. candidates; \*\*\* Completed a non-thesis degree; \*\*\*\* left the program to South Africa; \*\*\*\*\* Extended one semester of U.S. coursework (to take some advanced studies - courses not offered at PGIA)

## APPENDIX XII

### DARP CONSTRUCTION CHRONOLOGY OF ACTION

#### Selection of A& E Services Contractor:

- January 23, 1985 - Draft RFTP and prequalification questionnaire prepared by AID.
- February 15, 1985 - Above reviewed at Ministry of Agricultural Development and Research (MADR) meeting.
- March 13, 1985 - RFTP revised.
- April 12, 1985 - Prequalification notice published (closing date May 2, 1985).
- June 27, 1985 - Cabinet Tender Board decided number of responses to prequalification inadequate and directed Department of Agriculture (DOA) to publish RFTP and at the same time call for qualification data.
- July 5, 1985 - DOA called for proposals (closing date July 29, 1985).
- September 3, 1985 - Evaluation Committee submitted report.
- September 11, 1985 - Cabinet Tender Board approved recommendations of Evaluation Committee on selection of A&E Services Contractor.

#### A&E Services Contract

- April 21, 1985 - Original date by which A&E contracting procedures were to be completed.
- April 30, 1985 - Completion period extended to August 31, 1985.
- August 8, 1985 - GSL requested extension of deadline for execution of contract with selected A&E firm from August, 1985, to November, 1985 (2 months).
- October 8, 1985 - AID sent draft A&E Services Contract to DOA for review.
- November 16, 1985 - Draft amendments suggested by Attorney General. Contract Document finalized.
- November 21, 1985 - GSL requested further 2 months extension of deadline to January 21, 1986.

- January 24, 1986 - A further extension of deadline requested by GSL.
- April 30, 1986 - Contract finalized and signed.

Preliminaries to Construction Program

- May 19, 1986 - Relocation of buildings from Karadian Aru to Aralaganwila agreed.
- June 6, 1986 - DOA proposed further changes in the accepted building program in the A&E Services Contract.
- July 31, 1986 - AID agreed to some of the changes and called for clarification of those new suggestions at four sites. (Details discussed at Project Management Committee Meeting during July, 1986).
- September 26, 1986 - AID agreed to some of the changes proposed by Deputy Directors.
- October 23, 1986 - Further proposals to set up a circuit bungalow at Maha Illuppallama and attend to repairs and furnishings turned down by AID.
- November 18, 1986 - Preliminary plans and designs of Contract No.1 reviewed by AID and comments sent to DOA/RDC.
- December 9, 1986 - Meeting of AID/RDC/DOA Engineers on preliminary plans and design Contract No.1.
- December 12, 1986 - Directorate (DOA) approved final list of buildings.
- January 6, 1987 - Further meeting organized by AID to seek clarification on design of Contract No.1.
- February 12, 1987 - Final estimate/BOQ on Contract No.1 recommended by SE(Civil), DOA to AID.
- March 19, 1987 - Meetings arranged to work out details of other construction contracts
- May 18, 1987 - 1st construction Contract: PIL issued.
- June-August, 1987 - Construction Contractors selected by MADR Tender Board for 1st Contract.
- July-September, 1987 - Plans/BOQ reviewed by DOA and AID Engineers on 2nd and 3rd contracts.
- September 15, 1987 - 2nd Construction Contract PIL issued.
- September 30, 1987 - Cabinet Tender Board approval awaited by DOA to make the awards for the 1st Contract.

1/25

## Appendix XIII

ANALYSIS OF DARP CONSTRUCTION COSTS  
(Rs. Million)

No:	<u>Construct. Contract</u>	<u>Project Paper Estimate</u>	<u>Preliminary Est/RDC</u>	<u>Final Est. (PIL)</u>	<u>Re-imbursable (Amt. (75%))</u>
1.	Makandura RRC	2.832		4.069	
	Nikaweratiya PC	0.846		2.037	
		<u>3.678</u>		<u>6.106</u>	<u>4.584</u>
2.	Angunukola RRC	2.559	4.100		
	Bata Ata F/PC	1.294	2.825		
	Bandarawela RRC	0.480	0.900		
		<u>4.333</u>	(+7 1/2% Contin.) <u>8.412</u>	(+ 3% Contin.) <u>7.746</u>	<u>5.810</u>
3.	Maha Illup.RRC	4.270	5.250		
	Pelwehera F/PC	2.339	4.860		
		<u>6.609</u>	(+7 1/2% Contin.) <u>10.868</u>	<u>10.666</u>	<u>8.000</u>
4.	Gannoruwa RRC	-	1.750		
	Girandurak RC	0.671	0.800		
	Alutarama F/PC	1.064	3.260		
		<u>2.558</u>	(+7 1/2% Contin.) <u>6.240</u>	<u>6.266</u>	<u>4.700</u>
	<u>Sub Total</u>	<u>16.978</u>	<u>25.526</u>	<u>30.784</u>	<u>23.100</u>
	Est. for Poranth F/PC	0.409		-	-
	Est. for Milinochi RRC	1.617		3.000*	2.250
	Est. for Aralaganwila RRC	-		7.500*	5.650
	Est. for Karadian Aru RC	3.332		-	-
	<u>Total</u>	<u>22.336</u>		<u>41.284</u>	<u>31.000**</u>

\* Current projections by USAID engineers.

\*\* Approximately \$1.05 million at current (9/87) exchange rate.

DATE: September 15, 1987  
 REPLY TO: *AC*  
 ATTNOF: S. H. Charles, AGR  
 SUBJECT: Diversified Agriculture Research Project (383-0059) - Construction

TO: John Robins/Charles Uphaus, Evaluation Team  
 Thru: Charles L. Strickland, AGR

Regional Research Centers

	<u>Project Paper</u>	<u>RDC Contract</u>	<u>Final</u>
<u>1. Makandura</u>			
Research Laboratory	1	1	1
Equipment Workshop	1	1	1
Store Room	1	1	1
Vehicle Yard	-	1	1
Grade III Quarters	3	2	2
Grade IV Quarters	3	3	3
Water Tank & distribution System	-	(Included)	
<u>2. Angunakulapelessa</u>			
Grade IV Quarters	4	4	4
Grade III Quarters	3	3	3
Equipment Workshop (improvements)	1	1	1
Field Stores with Processing Floor	-	1	1
Screen house	1	1	1
Refrigerated Store Facility	1	-	-
<u>3. Girandurukotte</u>			
Research Laboratory (Equipment Workshop)	1	1	1(cum office)
Grade III Quarters	1	-	-
Grade IV Quarters	1	-	-

	<u>Project Paper</u>	<u>RDC Contract</u>	<u>Final</u>
<b>4. <u>Maha Iluppalama</u></b>			
Research Laboratory (6000 sq ft)	1	1	1 (with RSF)
Screen House	1	1	1
Grade III Quarters	6	4	2
Grade IV Quarters	4	4	4
Girls' Hostel	-	-	1
Refrigerated Store Facility	1	1	(incl. in Res. Lab)
<b>5. <u>Bandarawela</u></b>			
Grade IV Quarters	1	1	2
Grade III Quarters	1	1	-
<b>6. <u>Gannoruwa (Rhizobium work)</u></b>			
Research Laboratory	-	1	1
Green House	-	1	1

### Seed Farms and Processing Centers

#### **i. Nikaweratiya PC**

Processing & Storage Building	1	1	1 (with RSF)
Remodelling of Processing and Storage building	1	1	1
Drying Floor	1	1	1
Refrigerated Store Facility	1	1	(incl. in Pr/St. Bldg)

#### **2. Bata-ata F/PC**

Processing & Storage Building	1	1	1 (with RSF)
Refrigerated Store Facility	1	1	(incl. in Pr/St Bldg)
Drying Floor	1	1	1
Re-modelling Storage Building	1	1	1
Grade II Quarters	1	1	1
Grade III Quarters	2	2	2

	<u>Project Paper</u>	<u>RDC Contract</u>	<u>Final</u>
<b>3. <u>Pelwehera F/PC</u></b>			
Processing & Storage Building	2	2	1
Storage Building	-	-	1 (with RSF)
Drying Floor	1	1	1
Re-modelling Storage Building	1	1	1
Grade II Quarters	2	2	2
Grade III Quarters	2	2	2
Grade IV Quarters	1	1	1
Refrigerated Stores Facility	1	1	(incl. in St Bldg)
<b>4. <u>Alutarama F/PC</u></b>			
Processing & Storage Building	1	1	1 (with RSF)
Drying Floor	1	1	1
Re-modelling Storage Building	1	1	1
Grade II Quarters	1	1	1
Grade III Quarters	2	2	2
Grade IV Quarters	1	1	1
Refrigeration Store Facility	1	1	(incl. in Pr/St Bldg)
<b><u>Karadian Aru RRC</u></b>			
Research Laboratory	1	- )	Station bombed and all buildings destroyed. This location dropped from project and resources to be transferred to Aralaganwila.
Equipment Workshop	1	- )	
Screen House	2	- )	
Store Room	1	- )	
Grade III Quarters	1	- )	
Grade IV Quarters	4	- )	
<b><u>Kilinochchi R.C.</u></b>			
Research Laboratory	1	- )	to be determined.
Grade III Quarters	1	- )	
Grade IV Quarters	2	- )	
<b><u>Aralaganwila System 'B' RRC (\$255,000/-)</u></b>			
		-	to be determined.

Paranthan F/PC

Refrigeration Stores Facility	1	- )	No inputs currently planned.
Re-modelling Storage Building	1	- )	
Grade II Quarters	1	- )	
Grade III Quarters	1	- )	

AID:AGR:SHCharles:v1

G.O.S.L. inputs for the period ending 30.06.87

Item	Planned L.O.P Rs.(M) 2	Budget for 1987 (GOSL Inputs) Rs.(M) 3	Actual Exp. To date in 1987 Rs.(M) 4	Actual Exp. in Cr. ended 30.06.87 Rs.(M) 5	Actual Exp. as at 31.12.1986 Rs.(M) 6	Total Exp. to date Rs.(M) 7	R E M A R K S 8
Technical assistance	4.49	—	.197	.113	.261	.458	Under this item office accomodations etc. provided for consultants are costed at U.S.\$200 per person shown as expenditure.
Training	.46	—	—	—	—	—	No provision has been made for item in G.O.S.L. Budgeting 1987. However arrangements have been to meet commitments to extent of about Rs.50,000/= on scholarships at P.C.I.A.
Commodities (clearance, storage, inland transport etc.)	1.24	5.25*	4.516*	4.516*	.092*	4.608*	
Facilities	9.68	3.09	—	—	.6	.6	Work on building programme will commence soon.
Personal	67.63	5.46	1.666	.894	3.504	5.17	
Operational & maintenance	55.48	3.96	.891	.461	.722	1.613	
Evaluation	.34	—	—	—	—	—	No provision has been made for Evaluation in 1987.
	139.32	17.76	7.270	5.984	5.179	12.449	

\* These figures include harbour charges & duty.

## 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			
Trailor	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 SF	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.

DIVERSIFIED AGRICULTURE RESEARCH PROJECT NO. 281-4058  
LOCAL PROCUREMENT LIST

ITEM NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	QUANTITY	STATUS/LOCATION	DATE RECEIVED	PL. NO.	C.I.F. VAL.	AGENT	LOCAL CHARGES REL.
1	Office Equipment	IBM	Facit Book	Unit 01	Econ. Division	November, 1966	-	876.00	-	-
2	Vehicles	Nissan	Blue bird Stat	4 Units 12	DAR, Peradeniya	August, 1966	-	11970.00	A.M.N.S. CO.	Rs. 10,000
3	Vehicles	Nissan	Blue bird Station Wagon	Units 02	DAR Peradeniya	September, 1966	-	16220.00	A.M.N.S. CO.	Rs. 15,000
4	Office Equipment	-	Electric Kettle	Unit 01	DAR Peradeniya	August, 1966	-	20.00	-	-
5	Office Equipment	Canon	Calculator	Units 08	DAR at Econ 2	August, 1966	11	140.00	-	-
6	Office Equipment	NO	Tastic Fan	Units 02	DAR Peradeniya	August, 1966	11	110.00	-	-
7	Office Equipment	OSK	Refrigerators	Unit 01	DAR, Peradeniya	September, 1966	11	250.00	-	-
8	Office Equipment	Alata	File Cabinets	Units 05	DAR 4 Econ 1	September, 1966	11	169.00	-	-
9	Park Bicycles	Hiro	Bicycle	Units 11	Seeds 16 Econ 1	October, 1966	11	145.00	-	-
10	Agricultural Equipment	HC Flow	Hand Spr. Sprayers	Units 18	Seeds	October, 1966	11	211.00	-	-
11	Agricultural Equipment	Urgent	Power Sprayer	Units 02	Res. 15 Grade 27	November, 1966	10	1100.00	-	-
12	Agricultural Equipment	Maala Engineers, Bangalore	Tractor Tractors	Units 08	Res. Division	October, 1966	10	6000.00	-	-
13	Vehicles	Nissan Daizu Yamaha Motors, Japan Mitsubishi M. Corp. Japan	Sunny Sedan Dodge Cab Motor Cycle Pajero Jeeps	Units 05 Units 05 Units 02 Units 10	Ec. 1 (No. 1/Res. 1/Seeds) - - Res. 7 Econ 2	June 1967 Pending Pending June, 1967	10 10 11 13-10	10770.00 - - 15000.00	A.M.N.S. CO. Sathosa, State Tracing United Motors	Rs. 10,000 - - Pending
14	Tractors	Ford Ford	4410 4410	Units 12 Units 04	- -	- -	14 14	- -	Sathasani Sathasani	- -
15	Agricultural Equipment	Dalton Cooper, USA	Disc Plow	Units 4	-	-	14	-	Sathasani	-
16	Agricultural Equipment	Dalton Cooper, USA	Disc Harrow	Units 10	-	-	14	-	Sathasani	-
17	Agricultural Equipment	Dalton Cooper, USA	Rotavator	Units 4	-	-	14	-	Sathasani	-
18	Agricultural Equipment	Dalton Cooper, USA	Ripper	Units 08	-	-	14	-	Sathasani	-
19	Computer Equipment	Radio Shack, USA	Tandy 4040s	Units 02	-	-	14	-	Bartlett's	-
20	Computer Equipment	Radio Shack, USA	Tandy 80	Units 02	-	-	14	-	Bartlett's	-
21	Computer Equipment	Radio Shack, USA	Printer DAP 220	Unit 01	-	-	14	-	Bartlett's	-
22	Computer Equipment	Radio Shack, USA	Printer DAP 270	Unit 01	-	-	14	-	Bartlett's	-
23	Computer Equipment	Radio Shack, USA	Accessories	-	-	-	14	-	Bartlett's	-
24	Computer Equipment	Radio Shack, USA	Software	-	-	-	14	-	Bartlett's	-
25	Computer Equipment	Nippon Elec. Japan	UP 1 1/2"	Units 10	-	-	14	-	Bartlett's	-
26	Computer Equipment	World Computers, Singapore	Printer Star 40	Units 02	-	-	14	-	Bartlett's	-
27	Computer Equipment	Bartlett's, USA	Software	-	-	-	14	-	Bartlett's	-

DIVERSIFIED AGRICULTURE RESEARCH PROJECT NO.383-005B  
PROCUREMENT LIST

ITEM NO.	COMM. CLASS	MODEL NO.	P10/P01/P1L NO.	STATUS/LOT/LATITUDE/QUANTITY
1	Agriculture Equip	Maize Thresh	47139	Bid Analysis 2
2	Agriculture Equip	Tractor Sprayer	47139	Bid Analysis 2
3	Agriculture Equip	Tractor Cultivators	47139	Bid Analysis 2
4	Agriculture Equip	Corn Planter	47139	Bid Analysis 2
5	Agriculture Equip	Water Pumps	47139	Bid Analysis 2
6	Agriculture Equip	Water Pumps	47139	Bid Analysis 2
7	Agriculture Equip	Water Pumps	47139	Bid Analysis 2
8	Agriculture Equip	Sprinkler Irrig. System	47139	Bid Analysis 1
8.1	Agriculture Equip	Sprinkler Circle Operation	47139	Bid Analysis 12
8.2	Irrigation Equip	Rustless Aluminium Pipes	47139	Bid Analysis 20
8.3	Irrigation Equip	Rustless Aluminium Pipes	47139	Bid Analysis 100
8.4	Irrigation Equip	Self Locking Sprinkler 76mm	47139	Bid Analysis 10
8.5	Irrigation Equip	Self Locking Sprinkler 89mm	47139	Bid Analysis 10
8.6	Irrigation Equip	Quick Coupler Stop 76mm	47139	Bid Analysis 10
8.7	Irrigation Equip	Quick Coupler Stop 89mm	47139	Bid Analysis 6
8.8	Irrigation Equip	Quick Coupler Pipes 76mm	47139	Bid Analysis 5
8.9	Irrigation Equip	Quick Coupler Pipes 89mm	47139	Bid Analysis 2
8.10	Irrigation Equip	Quick Coupler Reducer 89mm to	47139	Bid Analysis 15
8.11	Irrigation Equip	Quick Coupler Bends 89mm	47139	Bid Analysis 10
8.12	Irrigation Equip	Quick Coupler Bends 76mm	47139	Bid Analysis 6
8.13	Irrigation Equip	Quick Coupler 450 Bends -89mm	47139	Bid Analysis 10
8.14	Irrigation Equip	Quick Coupler 450 Bends -76mm	47139	Bid Analysis 6
8.15	Irrigation Equip	Spare A - Rings - 89mm - 76mm B - Pipes - 89mm - 76mm	47139	Bid Analysis 400 400 10 10
8.16	Irrigation Equip	Submersible Water Pump	47139	Bid Analysis
9	Irrigation Equip	Sprinkler Irrigation System	47139	Bid Analysis 2

9.1	Irrigation Equip	Sprinkler Circle Operation	47139	Bid Analysis	12
9.2	Irrigation Equip	Rustless Aluminium Pipes 76mm	47139	Bid Analysis	24
9.3	Irrigation Equip	Rustless Aluminium Pipes 89mm	47139	Bid Analysis	108
9.4	Irrigation Equip	Self Lockings 76mm	47139	Bid Analysis	10
9.5	Irrigation Equip	Self Lockings 89mm	47139	Bid Analysis	15
9.6	Irrigation Equip	Quick Coupler Stop 76mm	47139	Bid Analysis	15
9.7	Irrigation Equip	Quick Coupler Stop 89mm	47139	Bid Analysis	20
9.8	Irrigation Equip	Quick Coupler Stop 76mm	47139	Bid Analysis	6
9.9	Irrigation Equip	Quick Coupler T pipes 76	47139	Bid Analysis	3
9.10	Irrigation Equip	Quick Coupler T pipes 89mm	47139	Bid Analysis	10
9.11	Irrigation Equip	Quick Coupler Reducer 89mm	47139	Bid Analysis	15
9.12	Irrigation Equip	Quick Coupler 90o Bends - 89mm	47139	Bid Analysis	15
9.13	Irrigation Equip	Quick Coupler 90o Bends - 76mm	47139	Bid Analysis	6
9.14	Irrigation Equip	Quick Coupler 45o Bends - 89mm	47139	Bid Analysis	14
9.15	Irrigation Equip	Quick Coupler 45o Bends - 76mm	47139	Bid Analysis	6
9.16	Irrigation Equip	Diesel Engine Pumps	47139	Bid Analysis	
9.17	Irrigation Equip	Spares	47139	Bid Analysis	
		A - Rings			
		89mm			400
		76mm			400
		B - Pipes			
		89mm			10
		76mm			10
10	Irrigation Equip	Water Pump 2" - 50mm	47139	Bid Analysis	1
11	Irrigation Equip	Water Pump 3" - 76mm	47139	Bid Analysis	1
12	Irrigation Equip	Water Pump 2" - 50MM	47139	Bid Analysis	1
13	Irrigation Equip	Water Pump 6" - 152mm	47139	Bid Analysis	1
14	Testing Equip	Quick Moisture Meter	47139	Bid Analysis	10
15	Testing Equip	Seed Triers	47139	Bid Analysis	20
16	Testing Equip	Measuring Cylinder	47139	Bid Analysis	20
17	Testing Equip	Plastic Sample Bottles	47139	Bid Analysis	250
18	Testing Equip	Resine Cloth	47139	Bid Analysis	10
19	Testing Equip	Sieves - Testing Weed	47139	Bid Analysis	10

20	Testing Equip	Germination Paper	47139	Bid Analysis	5000
21	Testing Equip	Hangingier for Seed Analysis	47139	Bid Analysis	10
22	Testing Equip	Sample Pan	47139	Bid Analysis	20
23	Testing Equip	Seed Forceps	47139	Bid Analysis	25
24	Testing Equip	Germination Trays A - 15cm x 21cm x 2 1/2cm B - 14cm x 16 1/2cm x 4 1/2cm	47139	Bid Analysis	500 500
25	Testing Equip	Platform Weighing Machine	47139	Bid Analysis	4
26	Fumigation Equip	Fumigation Set Filters Gas Masks Harness Straps Degesh Fumigation Sheets Gas Testers Detector Tubes Sheet Clamps for Fumigation	47139	Bid Analysis	4 100 24 24 20 20 150 150
27	Air Conditioner	Window/Wall Type	47139	Bid Analysis	4
28	Refrigerators	capacity 8 feet and 12 feet	47139	Bid Analysis	7
29	Workshop Equipment/Tools	Hydraulic Jack	47139	Bid Analysis	3
30	Workshop Equipment/Tools	Chain Block	47139	Bid Analysis	3
31	Workshop Equipment/Tools	Air Compressor	47139	Bid Analysis	3
32	Workshop Equipment/Tools	Shop Tool Kits	47139	Bid Analysis	3
33	Workshop Equipment/Tools	Welding Plant	47139	Bid Analysis	3
34	Meteorological Equipment	Weather Monitoring Equipment	47139	Bid Analysis	
34.1	Meteorological Equipment	Non-recording rain gauge	47139	Bid Analysis	4
34.2	Meteorological Equipment	Glass Measuring Cylinders	47139	Bid Analysis	4
34.3	Meteorological Equipment	Stevensens Screen	47139	Bid Analysis	4
34.4	Meteorological Equipment	Maximum Thermometer	47139	Bid Analysis	4
34.5	Meteorological Equipment	Maximum Thermometer	47139	Bid Analysis	4
34.6	Meteorological Equipment	Wet-Dry Bulb Thermometer	47139	Bid Analysis	4
34.7	Meteorological Equipment	Still Well and Hook Gauge	47139	Bid Analysis	4
34.8	Meteorological Equipment	Brass Hook Gauge	47139	Bid Analysis	4
35	Packing, Inland Transport		47139		
36	Shipping Insurance		47139		
37	PSA Fees		47139		
	TOTAL COSTS		47139		

## APPENDIX XVIII

UNITED STATES GOVERNMENT

## memorandum

DATE: September 16, 1987  
 REPLY TO: *Ad*  
 ATTN OF: S. H. Charles, AGR  
 SUBJECT: Diversified Agriculture Research Project (383-0058) - PIO/C Procurement  
 TO: John Robin/Charles Uphaus, Evaluation Team

Reference your request, the chronology of the PSA selection, award and first PIO/C issuance are given below:

January 24, 1985 - PSA solicitation despatched.

February 7, 1985 - Treasury approved using a PSA.

June 27, 1985 - Cabinet Tender Board (CTB) accepted six PSA proposals and authorized the D.O.A. to proceed with evaluation.

August 9, 1985 - D.O.A. PSA evaluation completed. Draft PSA contract forwarded by USAID to both D.O.A. and MADR.

August 19, 1985 - AID Regional Commodity Management Officer met D.O.A. & MADR officials to discuss PSA contract.

August 23, 1985 - D.O.A. approved PSA contract and forwarded to MADR for clearance.

September 1985 - CTB approved D.O.A. PSA evaluation and authorized opening of negotiations with No. 1 ranked firm following GSL approval of draft PSA contract.

Sept, October -  
November, 1985 - MADR and Attorney General clearance of draft PSA contract completed and USAID approves.

December 2, 1985 - D.O.A. cabled Connell Bros. inviting them to negotiate a contract.

December 16-19, 1985 - Connell Bros. representative arrived and reached agreement on contract terms with D.O.A. negotiating team. Only contract changes were addition of a final payment clause and a negative payment clause.

OPTIONAL FORM NO. 10  
 REV. 1-80  
 GSA FPMR 41 CFR 101-11.6  
 5010-114

FORM NO. 1010-114 - 383-0058 - 101-114

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- January 1986 - USAID approved negotiated contract.
- Early February 1986 - CTB disapproved the final payment clause which had been added during contract negotiations.
- March 31, 1986 - D.O.A. Airmailed PSA contract (with clause deleted) to Connell Bros. for signature.
- April 15, 1986 - Connell Bros. received contract and wrote D.O.A. noting omission of final payment clause.
- May 2, 1986 - D.O.A. cabled Connell Bros. advising that final payment clause was deleted by the CTB.
- May 28, 1987 - USAID proposed to MADR that the final payment clause be included in the L/Comm. (Attachment 1).
- June 3, 1986 - MADR approved addition of final payment clause to L/Comm.
- June 4, 1986 - USAID cabled Connell Bros. advising that addition of final payment clause in the L/Comm was approved.
- June 5, 1986 - Connell Bros. agreed to accept final payment clause in L/Comm but also proposed shortening the contract termination date to June 30, 1988 rather than August 31, 1992. (D.O.A. cable sent same day advised termination date of 8/31/1992).
- June 24, 1986 - Connell Bros. cabled that they stand firm on June 30, 1988 contract termination date.
- July 9, 1986 - D.O.A. letter to Connell Bros. again specifies termination date of August 31, 1992 and requests that Connell Bros. accept or reject.
- July 14, 1986 - Connell Bros. stood firm on termination date.
- July 22, 1986 - D.O.A. cabled Connell Bros. proposing compromise termination date of December 31, 1990.
- July 29, 1986 - Connell Bros. refuses to accept 12/31/90 termination date.

- August 21, 1986 - Negotiations terminated with Connell Bros. (Attachment 2).
- August 22, 1986 - Cabinet Tender Board approves opening negotiations with second ranked AAPC (Attachments 3, 4 & 5).
- December 11, 1986 - AAPC/DOA Contract signed.
- January 13, 1987 - 1st PIO/C despatched.
- April 23, 1987 - Bids closed.
- July 1, 1987 - 1st PIO/C. Bid Evaluation and recommendations received.
- August 26, 1987 - DOA/Cabinet Tender Board decided all bids non-responsive.
- September 6, 1987 - USAID approved informal procurement procedure.
- September 15, 1987 - Letter advising informal procurement sent to B.O.A. (Attachment 6).
- September 20, 1987 - AAPC sent new bid analysis via DHL.

AID:AGR:CLStrickland:vl  
 September 16, 1987  
 COHREF: AGRCS002

## APPENDIX XIX

### The " Split Training" Program in Morocco

The following are excerpts from the 1985-86 annual report of Morocco project 608-0160, submitted by the University of Minnesota in January, 1987.

" The Institute Agronomique et Veterinaire Hassan II, and the University of Minnesota, with financial support from the U.S. Agency for International Development, have been collaborating in education and research since 1970. Current activities are supported by a host country contract, signed in 1980 and extended in 1985 to April 1990.

Briefly, the purpose and goals are to assist with faculty training and related institution building activities of the Institute Agronomique et Veterinaire Hassan II (IAV), Ecole Nationale d'Agriculture de Meknes (ENA) and Ecole National de Forestry Engineers de Sale (ENFI). These activities will provide scientists, managers and technicians needed for Morocco's agricultural development and develop the linkages between education, research and extension to improve the lot of low income farmers and herders.

The major output of the project will be : trained Moroccan faculty members of IAV, ENA and ENFI; graduate level programs offered in the agricultural and social sciences at IAV; and theses and publications developed in Morocco. The Project will also assist the doctoral candidates to contribute to the broader institutional development of research and extension linkages of IAV, ENA and ENFI.

This Project is a follow-up Project from two previous projects and contracts. The cooperation between the University of Minnesota, IAV and USAID has been ongoing since 1970. The first Project started in 1970 and primarily provided technical assistance in undergraduate (second cycle) teaching in soil science and later in agronomy and horticulture. The second project (1976-1980) saw an evolution of emphasis by providing assistance to Masters of Science level programs (Third Cycle) of IAV and a broadening to fields of plant pathology, rangeland management and watershed management. Increasing numbers of Third Cycle students were sent as participants to the U.S., for one year of beginning graduate level work and returned to Morocco to complete their memoirs (thesis), with the support of a resident team. By 1980 IAV was offering Third Cycle programs entirely at the Institute in Soil Science and Watershed Management and was beginning to offer the Third Cycle in other fields.

The present project was designed in 1979 through the collaborative assistance mode to deal with one of the major pieces of unfinished business in IAV's drive to institutional maturity - the development of Moroccan faculty. During the 1970's, IAV experienced

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phenomenal growth of students (from 16 to 2,300), of programs (23 in 1980), of budget and of institutional philosophy. The creation of a well trained moroccan faculty became the critical element for IAV's institutional growth to continue and to permit it to become self-supporting and capable of generating the human capital so urgently needed to manage and support Morocco's agricultural development

The present Project also provided for broadening of support from a few well chosen disciplines to the whole of the Institute and a formalization of the institution building goals of AID's assistance which, although part of preceding projects, was subsumed under more limited objectives.

The Project is unique in that, subordinate to its institution building goals, the faculty development activities are planned within the framework of the institutional growth of IAV, ENA and ENFI. For example, the faculty is not being developed by simply sending participants to the U.S for Ph.D. training. Rather, all faculty participants upon completion of their preliminary examinations in the U.S. return to Morocco and conduct dissertation research on Moroccan topics, in Morocco at the Institute. They are awarded the degree Doctorat es Sciences Agronomiques on successful defense of the dissertation. Not all participants attend the University of Minnesota. Active support and placement of the faculty at twenty-three U.S. universities has been achieved. A list of cooperating Universities is attached. The faculty therefore, creates the Doctorat es Sciences Agronomiques degree which is awarded by IAV.

Over the years, AID has been successful in Morocco in making a long term commitment to institutional development. The rapid development of IAV, ENA and ENFI is now beginning to be appreciated as not only a necessary and vital part of AID development assistance strategy but also as a necessary condition for the development of Moroccan agriculture.

Thus the initiation of the present Project in June 1980, and its continuation in 1985 marked more than just a major new commitment by AID to Moroccan agricultural development. It was a milestone in the institutional history of IAV, ENA and ENFI and the beginning of their emergence as independent, national institutions, taking their place in the international community of agricultural sciences and capable of their own sustained contribution to Moroccan agricultural development. The job is not yet completed - but the goal is a realizable one.

Participants trainees are faculty members of IAV, ENA and ENFI in doctoral and M.S. programs, and third cycle students of IAV who come to the U.S. generally for 12-15 months beginning graduate training and then return to do their "memoire" in Morocco under

direction if the IAV faculty. The combined Minnesota-IAV Projects, since the beginning in 1972, have hosted 354 participant academic programs; 210 Third Cycle students, and 114 Doctoral and 30 Master of Science participants from the faculty.

During FY 86, 19 faculty arrived for doctoral study for a total of 114 doctoral programs in progress or completed. Twenty faculty completed their doctoral course work and preliminary examinations during the year and returned to Morocco to pursue their dissertation research. Fourteen faculty completed doctoral programs during the year; 13 IAV Doctorats and one U.S PhD.

A second "modified" doctoral program was initiated in Plant Breeding in FY 86 in which the participants complete an agreed amount of course work and experience in the U.S. and then complete their examinations, research and dissertation in Morocco with a co-advisor at IAV. The first such modified program was initiated in Dairy Science in FY 85 and the participant returned to IAV this year to pursue research prior to returning next year for additional course work.

Eighteen faculty were engaged in M.S. programs in the U.S. during FY 86. There were six new programs initiated and eight programs completions during the year, and ten programs in progress at the end of the year. The total faculty M.S. degree programs to date is 30 in 13 major fields of study and including 12 other universities.

The doctoral participants returning to Morocco during the year completed their U.S. studies in an average 29.6 months (compared with 29.1 in FY 85, 29.3 in FY 83, and 29.6 in FY 84) including supplemental language training as necessary. The time range was 25 to 33 months with 29 months as the modal class.

Due to long term efforts at IAV to enhance English Language training for participants who will study in the U.S., most faculty and third cycle student participants arrived in FY 86 with a strong English background sufficient to achieve near proficiency during an intensive supplemental English program. The value and the advantage of this continued emphasis upon English language at IAV is essential for achieving participant program objectives within the limited time available to them".

As can be noted, there is a strong parallel between the IAV/Minnesota project and the PGIA/DOA/IIE relationship under DARP. One significant difference is evident from the following quotes from an AID evaluation of the project completed in 1985.

" A review of the original project paper documentation reveals

that the option of the IAV doctorate was always considered an integral part of the institutional strengthening strategy. Doctorates (Ph.D.'s) granted by American Universities were not conceived as consistent with this objective and are not included as project outputs. Although there has been considerable debate over the past three years as the first doctoral candidates completed their degree requirements, the evidence indicates that the IAV doctorate option as an institutional development strategy remains a sound option, at least in the short and medium term. The paragraphs below summarize the key aspects in this debate

The primary motivation of IAV is to establish the Moroccan doctorate as equivalent to the American Ph.D. degree and to have it recognized as such internationally. This would be achieved by enrolling IAV faculty in formal Ph.D. programs at American Universities. Upon completion of all pre-dissertation requirements, the IAV faculty member would return to Morocco to conduct his dissertation research. Defense of the thesis occurs in Morocco in the presence of an international jury presided over by the student's American faculty advisor.

The motivation of IAV faculty participants seems to stem largely from fear that the IAV degree will not be widely recognized internationally as the equivalent of the Ph.D. (even though they will have completed all requirements for the Ph.D.) and that the Doctorate es Sciences (DES) will not have the same marketing value on the international job market.

Motivation of American faculty, which is largely supportive of the student position, is to get credit for completed doctoral degree of their advisees (for promotion and departmental peer review). In a stand for "academic freedom" the University of Minnesota faculty council voted to grant a Ph.D. to a student once he had completed the requirements for his DES.

For some, the central issue is one of individual rights. As long as a student respects IAV rules for completing the requirements of the IAV doctorate, it can be argued that it is the student's business if he then uses his own resources to acquire the Ph.D.

The IAV leadership seems to have adopted such a position. While joint degrees are deplored for the alleged devaluing effect they have on IAV doctorates, IAV leadership is willing to tolerate students who pursue Ph.D. degrees after fulfilling all requirements for the IAV doctorate.

In the future, IAV students will be decreasingly enrolled in pre-

dissertation programs but will complete only specialized coursework in the U.S. On the one hand, this fact may reduce the emotional elements of the debate, since IAV faculty will no longer be eligible to complete the requirements of the Ph.D. degree. On the other hand, American faculty may be less committed to working with IAV participants who are not degree candidates".

A concluding comment of the evaluation team follows:

"The rationale for offering doctorate degrees only in Morocco (v. the American Ph.D. granted by a Title XII university) is a sound institutional policy the pursuit of which will not adversely affect project goals in the short to medium term".

As suggested in the evaluation report, the DARP evaluation team has urged the DDA/USAID/DAI/FGIA team to explore options for more effectively implementing the split training program. We think the Hassan II model as well as others can be instructive.

## APPENDIX XX

### CONTACTS/COOPERATION WITH OTHER INSTITUTIONS

Considerable effort has been made to learn of the activities of various institutions, projects and consultants to benefit from their experience and, if appropriate, to complement their activities. Information has been exchanged and common interests explored with the following organizations:

1. Abt Associates Inc., Planners:
  - a) coordination of plans for diversified agriculture in Sri Lanka
  - b) provided office equipment for their use
2. Asian Development Bank
  - a) plans for establishment of a diversified agricultural project with emphasis on fruits and vegetables
  - b) meeting and correspondence concerning the establishment of farmers on new lands in the Anuradhapura district
3. Australia: common interests in weed control
4. Canadian International Development Agency
  - a) common interests in a planned project in Food and Nutrition
  - b) common interests for assistance to new farmers in the Moneralega area
5. Ceylon Oils and Fats Corporation
  - a) common interests in commercial seed production
6. CHAM Hill Project:
  - a) complementary activities in soils and water management research
7. Directorate General for International Cooperation (Dutch)
  - a) common interests in improved seed storage
  - b) common interests in privatization of the seed industry
  - c) cooperation in a planned seed workshop
8. European Economic Community:
  - a) common interests in Mahaweli System C: appropriate crops and homestead gardens for immigrants
9. Food and Agriculture Organization
  - a) support for Pesticide Registration in terms of training, chemicals for the laboratory and technical expertise
  - b) upland rice production in rainfed areas
  - c) utilization of FAO fertilizer results in research and on-farm trials
  - d) common interests with the FAO Horticultural Project
  - e) coordination of training programs
  - f) quarantine program

10. International Development Research Center
  - a) complementary participation for development of SFCs
  - b) common interests with the "Plenty" soybean nutrition project
11. International Irrigation Management Institute
  - a) complementary activities in water management
  - b) complementary activities in a data base study in soil and water management
12. Israel Interests Section/American Embassy
  - a) complementary participation for short-term training of scholars in Israel
  - b) complementary participation on development of SFCs projects of interest to the Extension division
13. Mahaveli Economic Authority
  - a) cooperation in research, extension and seed activities in Systems B and C
14. PGIA/ University of Peradeniya
  - a) training of post-graduate DOA/DARP scholars
  - b) cooperation in organization of short courses
15. University of Peradeniya
  - a) coordination of research (and extension) with the ICA
  - b) organization of short courses for scholars from the ICA
  - c) project coordination for an manual on weed identification and control
  - d) cooperation in a maize testing program
  - e) cooperation in assessing the storage environment in DOA warehouses
16. University of Ruhuna
  - a) cooperation in a breeding program of sesame and maize
17. US Peace Corps

EARP provided:

  - a) temporary office facilities
  - b) assistance in contacting DOA personnel
  - c) assistance in writing a project for funding
  - d) assistance to the head of the Peace Corps in identifying
18. World Bank
  - a) common interests in diversified agriculture in Sri Lanka
  - b) coordinated training programs for Sri Lanka