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AGRICULTURAL EDUCATION
DEVELOPMENT

Academy for Educational Development, Inc.
The Pennsylvania State University
Texas A&M University
Virginia Polytechnic Institute and State University

Agricultural Education Development Project
FIRST ANNUAL FIELD OFFICE REPORT
(April-December 1979)
and
PLAN OF IMPLEMENTATION

February 1980

Prepared under Contract No. AID/ASIA-C-1397
for Technical Services to Project 383-0049
for Agricultural Education Development
(Sri Lanka)

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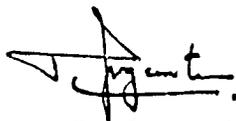
Foreword

This First Annual Field Office Report on the Agricultural Education Development Project summarizes activities and progress during its first nine months in existence, and presents our detailed plan of implementation for the total life of the Project. A brief description of the Project is also included for the benefit of those who may not have had earlier knowledge of it.

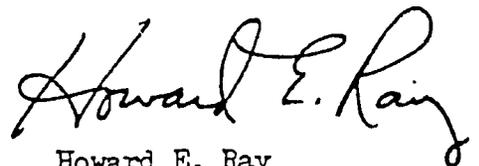
The period covered by the Report may be described as the preparation and startup phase. It was also the "getting acquainted" stage. At the outset, neither PGIA/FA nor Project staff were quite sure what to expect from or how best to work with the other; and some communications problems were inevitable. Such problems were of a minor nature, however, and effective working relationships developed rapidly.

Part Four, the plan of implementation, conforms in large part to the March 1979 operational plan. That earlier plan has been reviewed, updated, and revised, however, as the end result of a series of activities over a period of the last five months that involved the PGIA/FA staff and administrators, Project field staff, all Consortium members, and USAID. Although it represents the combined judgment as of February 1980 of all who were involved, this plan must be updated frequently if it is to serve the Project most effectively.

Peradeniya
February 1980



T. Jogaratnam
Director, PGIA



Howard E. Ray
CAED Chief of Party

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Agricultural Education Development Project

FIRST ANNUAL FIELD OFFICE REPORT (April - December 1979)

and

PLAN OF IMPLEMENTATION

PART ONE

SUMMARY

The Agricultural Education Development (AED) Project is an AID-funded project of assistance in the development of the Postgraduate Institute of Agriculture and Faculty of Agriculture of the University of Peradeniya. The AID assistance is being provided through a contract with the Academy for Educational Development functioning in consortium with the Pennsylvania State University, Texas A & M University, and Virginia Polytechnic Institute and State University. Professor T. Jogaratnam, PGIA Director, has been designated as Project Director; and Dr. Howard E. Ray serves as Chief of Party in Sri Lanka for the Consortium.

The AED Project field office was established at the PGIA in July 1979. During the remainder of the year, ten assistant lecturers were sent to the U.S. for PhD training in one of the Consortium universities, and two more were expected to start in January 1980. Approximately 24 person-months of technical assistance were provided to the PGIA/Faculty. Included, in addition to the Chief of Party, were specialists in facilities planning, experiment farm development, animal physiology, animal breeding, monogastric nutrition, entomology (2), agricultural marketing, agrostology, and waste management. Eight jeep vehicles were procured, with delivery in Sri Lanka expected in early 1980. A systematic review and reassessment of the AED Project designed to culminate in a revised and detailed Plan of Implementation was undertaken during the last quarter of 1979. Seventeen reports of various types were prepared by Project personnel during the July-December period. In compliance with the present Higher Education Act, the University Grants Commission drafted a new Ordinance to govern the PGIA to become effective in January 1980.

The Plan of Implementation, Part Four of this Report, was first developed out of the abovementioned review and reassessment. That draft was considered in detail at the Consortium Council meeting in early February 1980, and has now been rewritten to reflect Council decisions and followup discussions. It is organized into eleven major sections plus appendices: administration and management, facilities planning and development, training, technical assistance, library development, experiment farm development, commodity procurement, institutional and project planning, other Project components, Project costs, and potential new Project components. This plan, keyed to the 1979 operational plan, presents details of Project action as presently projected and establishes procedures for following through with the various Project components.

PART TWO

PROJECT DESCRIPTION

The present Agricultural Education Development (AED) Project grew from a request for assistance originally submitted to USAID in early 1977 by the Director of the recently-formed Postgraduate Institute of Agriculture (PGIA) of the University of Sri Lanka. That request documented the need for outside assistance to permit the PGIA to develop the capability to meet most of Sri Lanka's demand for high level agriculturally trained manpower, and indicated the kinds of assistance that would be required.

Results of a late 1977 investigation by the Academy for Educational Development, in collaboration with the PGIA and Faculty of Agriculture, verified that: (1) a continuing demand for baccalaureate and postgraduate degree holders in agriculture was likely, and that such demand would probably expand somewhat in the near future; and (2) with appropriate assistance, the PGIA and Faculty had the potential for developing the capacity to provide high quality undergraduate and postgraduate training to meet the greater part of that demand. The study also defined more precisely the kinds and magnitude of outside assistance needed for development of that capacity.

The request for assistance then passed through customary channels which culminated in the signing, on August 31, 1978, of a Project Grant Agreement between the Government of the Republic of Sri Lanka and the United States of America for Agricultural Education Development (A.I.D. Project Number 383-0049). The United States Agency for International Development later contracted with the Academy for Educational Development (in consortium with Pennsylvania State University, Texas A & M University, and Virginia Polytechnic Institute and State University) to provide the technical services called for under the Project Grant Agreement.

I. Justification

Justification for expansion of the PGIA and Faculty of Agriculture was articulated in the Project Grant Agreement:

Additional trained personnel are needed in Sri Lanka to plan and implement programs to develop the agricultural potential of the country. While additional skilled personnel are needed at all levels the need for more B.Sc. and advanced degree graduates is particularly acute. Such graduates readily find employment and no pool of unemployed graduates exists. Existing capacity to train graduates is minimal and does not meet identified demand. This capacity is limited to the Faculty of Agriculture at the University of Sri Lanka, Peradeniya Campus, which produces approximately 100 B.Sc. graduates a year and the recently formed Post Graduate Institute of Agriculture also at Peradeniya which utilizes

faculty staff and the part time services of government or private sector employees to instruct graduate students.

Significant expansion of these institutions is necessary to meet the demand for trained personnel. The alternative of continued training abroad in Agriculture is not only more costly in the long run but the training so provided often lacks relevance to Sri Lanka. An expansion of trained people at the B.Sc. and advanced degree levels is directly relevant to and beneficial for the poor in Sri Lanka where the bulk of the poor are on agricultural land, the majority of land is in small holdings, agriculture figures prominently in the economy, and where development has emphasized equity.

The creation of a second Faculty of Agriculture in the new Ruhuna University at Matara does not significantly alter the situation described above, as maximum intake projected for that Faculty is only fifty students per year. Furthermore, the PGIA will continue to be the only institution in Sri Lanka granting postgraduate degrees in agriculture.

II. Description

The purpose of the AED Project is to double the number of BSc graduates and triple the number of postgraduates trained in this country annually by 1985. The means for achieving this purpose is expansion of the two premier Sri Lankan institutions training higher level agricultural personnel--the Postgraduate Institute of Agriculture and the Faculty of Agriculture of the University of Peradeniya--which share a common professional staff and many facilities.

The Project, located at Peradeniya, is being implemented by the PGIA in close association with the Faculty of Agriculture utilizing assistance provided by USAID through contract with the Academy for Educational Development as cited earlier. Principal components of that assistance include:

1. Approximately twenty-two person years of technical assistance, primarily consisting of short and long term visiting faculty;
2. Ph.D. training for up to 38 participants, primarily at member universities of the consortium (the training is designed to maximize time in Sri Lanka and relevance to Sri Lankan problems. Course work will be taken in the U.S., the trainee will return to Sri Lanka for dissertation research, and go back to the U.S. to complete degree requirements);
3. Equipment and vehicles for the PGIA and Faculty of Agriculture;

4. Books, material, and equipment for a library;
5. Staff per diem and supervisory visits;
6. Miscellaneous expenses.

The Government of Sri Lanka, in turn, will contribute:

1. Local operating expenses;
2. Additional on-campus buildings and furniture;
3. Additional off-campus (farm) facilities;
4. A portion of the vehicles required for the Project;
5. Existing facilities and equipment.

The Project is of seven years duration, scheduled to terminate in early 1986.

III. Objective

The objective of the assistance projected under the AED Project, stated in its most simple form, is:

To contribute to the balanced development of the teaching, research and outreach programs of the Postgraduate Institute of Agriculture and Faculty of Agriculture of the University of Peradeniya.

IV. Planning and Implementation Documents

Relevant planning and implementation documents for the Agricultural Education Development Project include:

- A. Postgraduate Institute of Agriculture, University of Sri Lanka: A Preliminary Assessment. December 1977.
(Prepared by the Academy for Educational Development under Contract No. AID/AFR-C-1131, Work Order No. 24 (Sri Lanka) for AID.)
- B. Project Paper for Project No. 383-0049, Agricultural Educational Development (Sri Lanka). AID. June 2, 1978.
- C. Project Grant Agreement Between The Government of the Republic of Sri Lanka and the United States of America for Agricultural Education Development (A.I.D. Project Number 383-0049). August 31, 1978.

- D. Project Implementation Order/Technical Services No. 383-0049-3-80004 for Agricultural Education Development TA Contract, Project No.383-0049. AID. November 21, 1978.
- E. Request for Proposal No. 80004 - Agricultural Education Development Project in Sri Lanka. AID. December 11, 1978.
- F. Implementation Letter No. 1, Project No. 383-0049, Agricultural Education Development. AID. December 15, 1978.
- G. Proposal for Agricultural Education Development Project in Sri Lanka (in 5 volumes). Academy for Educational Development, Inc., in consortium with Virginia Polytechnic Institute and State University, Pennsylvania State University, and Texas A&M University, January 22, 1979.

(Submitted in response to RFP No.80004)

- H. Amendment No. 1 to Project Grant Agreement Between the Government of the Democratic Socialist Republic of Sri Lanka and the United States of America for Agricultural Education Development (A.I.D.Project Number 383-0049). February 7, 1979.
- I. Agency for International Development Negotiated Contract No. AID/ASIA-C-1397 with the Academy for Educational Development, Inc. for Technical Services to Project No. 383-0049. Effective date: March 29, 1979.
- J. Subcontract between Pennsylvania State University and Academy for Educational Development for Agricultural Education Development Program, Sri Lanka (Prime Contract No. AID/ASIA-C-1397).
- K. Subcontract between Texas A&M University and Academy for Educational Development for Agricultural Education Development Program, Sri Lanka (Prime Contract No.AID/ASIA-C-1397).
- L. Subcontract between Virginia Polytechnic Institute and State University and Academy for Educational Development for Agricultural Education Development Program, Sri Lanka (Prime Contract No. AID/ASIA-C-1397).

V. Administration and Management

The Agricultural Education Development Project Director, designated by the Government of Sri Lanka, is Dr. T. Jogaratnam, Director of the PGIA; and Dr. Y.D.A.Senanayake, Dean of the Faculty of Agriculture, serves as the Co-Director. Mr. Charles Antholt, Agricultural Development Officer, USAID/Sri Lanka, served as USAID Project Manager from the inception of the

Project through the current reporting period. He was expected to be replaced by Mr. Thomas Wilson in early 1980.

Technical services and other assistance specified in the Project Grant Agreement are provided to the Project through Negotiated Contract No. AID/ASIA-C-1397 with the Academy for Educational Development as prime contractor, functioning in consortium with the Pennsylvania State University, Texas A&M University, and Virginia Polytechnic Institute and State University.

Key personnel provided by the Contractor for performance of the Contract include: Chief of Party - Howard E. Ray; Home Office Coordinator - John Elmendorf (through Sept. 1979), Stephen Moseley (acting Oct.-Dec. 1979); Senior Project Manager - Stephen F. Moseley. The organizational structure through which the Project is administered is shown in Figure 1.

VI. Other Donor Inputs

Several other international donors are also providing support to the PGIA/Faculty. Tripartite discussions among the PGIA/Faculty, British Council and USAID during the formative stages of the Project resulted in agreement that the U.K. would provide some dozen scholarships and three of the long term technicians for which needs had been identified. Such support had not yet been finalized, however, at the close of the current reporting period.

Significant British ODM assistance is currently being provided to the PGIA/Faculty. Mr. Howard Ross-Parker, biometrician, has completed his second year at Peradeniya. Six M.Phil. scholarships were awarded by the ODM for research on groundwater problems in the N.W. dry zone, and a long term agronomist has been provided to give direction and supervision to that research.

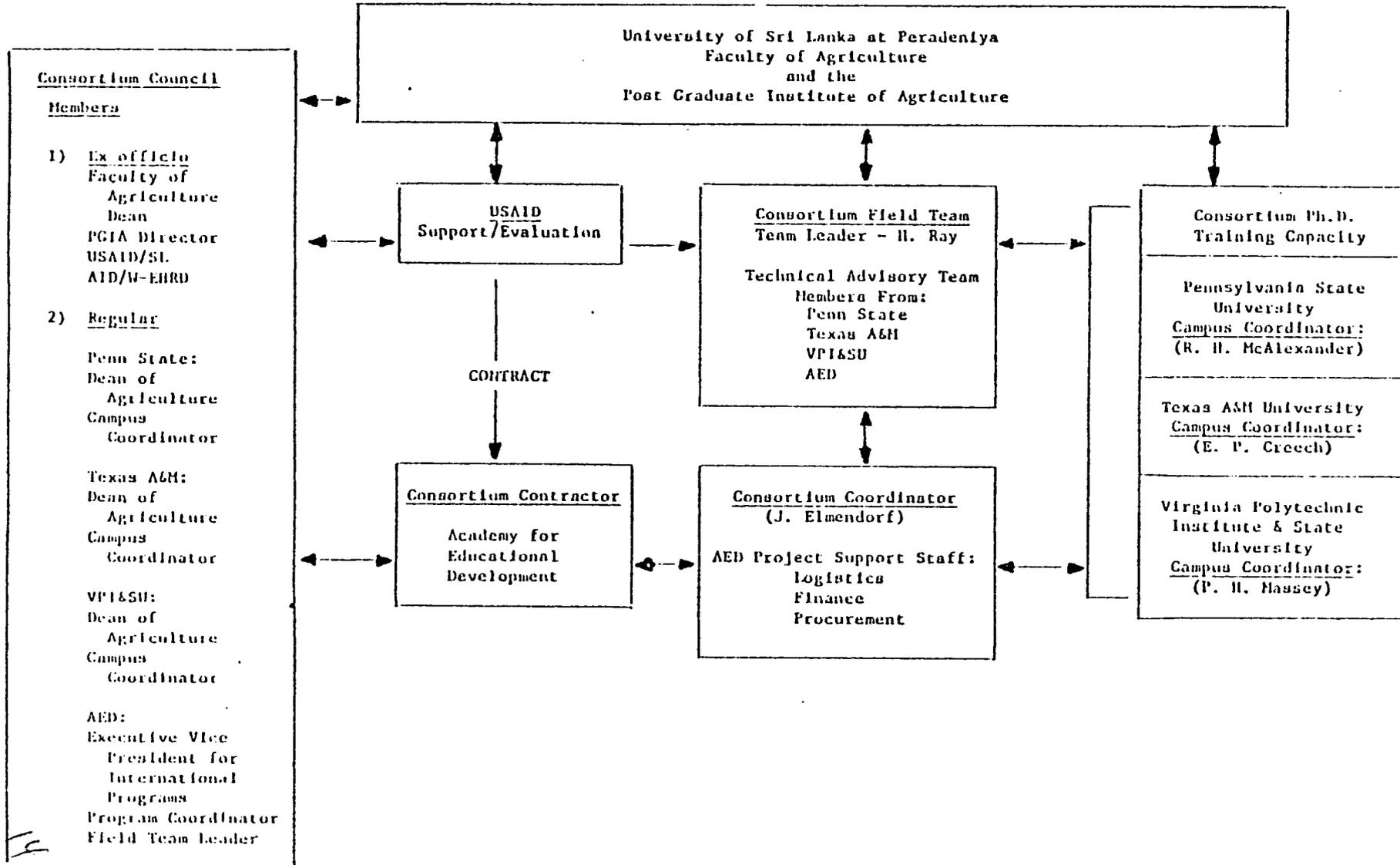
Prof. Peter von Blanckenburg arrived at Peradeniya in early 1979 on a one year assignment as visiting professor in extension from the Technical University of Berlin. Representatives of that University had substantive discussions with the GSL late in the year concerning the possibility of continuing association with and support of the PGIA/Faculty.

A collaborative arrangement initiated in 1972 with Obihiro University of Japan has continued. That agreement provides for groups of Sri Lankan students (two each year) to study for their Masters degrees in Japan and a like number of Japanese students to come to the PGIA. This exchange program is wholly funded by the Japanese.

A Canadian team visited Peradeniya late in the year to explore possibilities for supporting the development of the PGIA/Faculty. Among the alternatives discussed was fairly long term continuing research support to one or more departments.

Figure 1

OVERVIEW OF CONSORTIUM SERVICES STRUCTURE
FOR SRI LANKA AGRICULTURAL EDUCATION DEVELOPMENT PROGRAM



PART THREE

REPORT OF PROGRESS

The Agricultural Education Development (AED) Project shifted from planning to implementation with the signing of Contract No. AID/ASIA-C-1397, effective March 29, 1979. The field office was established in early July. Candidates for postgraduate training were interviewed and technician assignments projected for the remainder of the year were reviewed with department heads as early as late March and early April while Consortium representatives were in Sri Lanka for contract negotiation.

The April-June period was utilized by the Contractor and Consortium Universities to gear up for action. Logistical arrangements were developed, early orders placed for materials needed to equip the field office, technician assignments were finalized, and applications of prospective participants for admission to graduate study were processed by the three universities. The Consortium Council met for the first time in late May. Although Professors Jogaratnam and Senanayake, Project Director and Co-Director, could not attend that meeting, they did spend about two weeks in the U.S. in June.

Implementation progress was approximately as scheduled during the last half of 1979, except that the number of junior staff entering Ph.D. training programs was less than projected, and the number of work months of technical assistance was reduced as the result of discussions between PGIA/Faculty and the Contractor. Project activities and progress are presented in greater detail in the sections which follow.

I. Training

The present Project plan provides for Ph.D. level training in specified areas of specialization to approximately 38 staff members. The Project Paper specified that 21 would enter postgraduate training during the first year of operation, and that the remaining 17 would depart during the second year.

The above projections proved to be overly ambitious in two respects. Some sacrifice in quality would be almost inevitable if that many were to be selected in a single year due to the relatively small size of the available manpower pool. Furthermore, to do so would place an excessive burden on staff remaining at Peradeniya. For these reasons, a modified schedule was developed which distributes the departures for Ph.D. training over a three year period as shown in Table 1 below.

Ten participants entered PhD training in Consortium universities in August/September 1979, and four more are scheduled to start by June 1980. The details are given in Table 2.

Table 1. Original and revised schedules for departures of junior staff to U.S. for PhD training under the AED Project.

Academic year	No. projected to enter training	
	Original	Revised
1979-80	21	14
1980-81	17	17
1981-82	-	7-9*
Total	38	38-40

* The possible additions of 2 additional slots in 1981-82 are considered in Part Four of this report.

Table 2. PGIA/FA junior staff starting PhD training in the U.S. under the AED Project in 1979 or scheduled to start during first half of 1980.

Name	Field	Starting date	University
Mr. L.A.Perera	Agronomy	8/79	Penn State
Mr. K.Kailasapathy	Food Science	8/79	Penn State
Miss B.M.W.Dayawathie	Entomology	8/79	Texas A&M
Mrs. I.P.Wickramasinghe	Plant Breeding	8/79	Texas A&M
Mr. S.V.Rajakulendran	Entomology	8/79	Texas A&M
Mr. C.Bogahawatte	Agric. Economics	8/79 ^{1/}	Texas A&M
Mr. K.Jegasothy	Agric. Economics	1/80 ^{1/}	Texas A&M
Mr. C.Sivayoganathan	Communications	6/80 ^{1/}	Texas A&M
Mr. M.W.A.P.Jayatilake	Rural Sociology	6/80 ^{1/}	Texas A&M
Miss S.Panditharatne	Agronomy	9/79	Virginia Tech
Mr. V.Ravindran	Animal Science	9/79	Virginia Tech
Mr. K.G.A.Goonasekere	Agric. Engineering	9/79	Virginia Tech
Mr. S.S.Jayanayagam	Agric. Engineering	9/79 ^{1/}	Virginia Tech
Mrs. G.Ravindran	Food Science	1/80 ^{1/}	Virginia Tech

^{1/} Projected

Formal reports of participant performance had not yet been received at the close of the reporting period. Feedback from the Consortium universities, however, indicated that all ten participants did satisfactory work during the first term.

II. Facilities

Projected increases in annual intake of students by both the Faculty of Agriculture and PGIA cannot be accommodated with present facilities. An extensive building program was consequently included in the Five-Year Faculty Development Plan prepared in 1977. Recognizing that limitations of both available space and funds for construction would be serious constraints to obtaining the necessary facilities, the first short term consultant scheduled to arrive in Sri Lanka under the AED Project was a facilities or space utilization planner.

Among the major conclusions and recommendations of this consultant were: presently available space is totally inadequate to meet the future needs of the agricultural sub-campus; early development of a master plan for future agricultural sub-campus growth is imperative; all possible alternatives should be identified and evaluated as part of the master plan development; early appointment of a competent and experienced architectural firm to help develop the master plan, as well as to design and supervise construction of planned buildings, is urgently needed; consideration should be given to construction of a two or three-storey laboratory building adequate for the needs of Agricultural Biology, Agricultural Chemistry and a portion of Animal Husbandry (the latter as an interim measure) as the next phase of the Faculty building program. (See EOT Report 79-1, Facilities Planning by Prof. H. James Miller.)

The above-mentioned report was well-received. A major step taken to implement its recommendations was selection of an architectural firm to serve as consultants in master plan development, building design and supervision of construction. Also, arrangements were made to bring Prof. Miller, the Project's facilities planning consultant, back to Sri Lanka in January to follow up on his earlier work and to consult with the selected architectural firm.

A total authorization of Rs. 5,480,000 for on-campus building construction was included in the 1980 national budget, of which Rs. 1,500,000 are available for immediate use. Prospects appeared reasonably good for obtaining release of additional funds if construction should proceed rapidly enough to merit it. An additional Rs. 400,000 will also apparently be available to initiate planning of the library/classroom/administrative complex. The total authorized amounts will fall considerably short of covering actual requirements due to inflation and the need for certain specialized and high quality facilities.

The Faculty of Agriculture also requested Rs. 5,078,000 for off-campus experimental station development. No funds were included for that purpose in the final 1980 national budget, however. As a result of that omission, plans for development of the Dodangolla and Meewatura farms and the new Animal Husbandry field laboratory received serious setbacks.

Significant progress was made toward development of the Animal Husbandry field laboratory utilizing outside resources, and a preliminary plan was prepared for development of the Meewatura farm. Also, work on analysis and development of the Dodangolla farm continued. Nevertheless, lack of resources was expected to curtail progress seriously in 1980 (see Part Four).

III. Technical Assistance

Technical assistance provided to the PGIA/Faculty through the AED Project followed closely the schedule developed with the Department Heads in April, with two major exceptions. The plant breeder nominated by the Consortium and approved by the Project Director was unable to take the assignment for health reasons, and no suitable replacement could be recruited immediately. Second, the visit of the ruminant nutritionist was postponed until early 1980 as his Sri Lankan counterpart was on sabbatical leave in late 1979.

The total person-months of effort were somewhat less than originally programmed due to the joint decision of the PGIA Director, Dean of the Faculty, Department Heads and Contractor Chief of Party to shorten some of the initial assignments, and the fact that initial implementation activities were delayed somewhat by the later than expected date of signing Contract No. AID/ASIA-C-1397. A comparison between the originally programmed and actual levels of effort through 31 December 1979 is shown in Table 3.

All short term assignments for the year were completed by early December; leaving only the Chief of Party and Experiment Farm Development Specialist, both long termers, in Peradeniya at the end of the year.

Visiting expatriate professors taught all of two courses and parts of several others during the second academic term which terminated in late December. They also presented seminars and guest lectures, participated in curriculum reviews, became involved in research and facilities planning, traveled widely to become familiar with Sri Lankan agriculture and agencies seeking to serve it, and participated in activities of the departments with which they were associated.

The Departments provided offices and office furniture for each visiting professor and, in most cases, assigned a senior staff member to work in a counterpart relation with him. Departmental staff assisted in making appointments for the visiting professors with key contacts both in Peradeniya and elsewhere, and accompanied them on trips and to such appointments insofar as possible. At this early stage in the Project, neither

Table 3. Levels of effort originally programmed through 1979 under the AED Project compared to actual performance.

Assignment	Person-months in field through 1979	
	Programmed	Actual
Chief of Party	7 ^{1/}	6
Space utilization	4	1.5
Farm management	7	4
Cropping systems	1	-
Plant breeding	3	-
Entomology	3	3
Marketing	3	2.5
Environ. physiology	3	2
Animal breeding	3	1.5
Agrostology	3	1.5
Nutrition (monogastric)	3	0.75
Nutrition (ruminant)	2	-
Waste management	2	1.5
Total	44	24.25

1/ Also expected to provide technical assistance in Extension.

the department nor the visiting professor was quite sure about what to expect from the other and some communication problems were inevitable. These were minimal, however, and both Sri Lankans and visiting professors indicated that they considered their assignments to be beneficial to the development of the institution.

In all, approximately 24.25 person-months of technical assistance were provided in Sri Lanka to the AED Project by the Contractor from the effective date of the contract through December 31, 1979 (Table 3). Names, affiliations, and periods of service are detailed in Table 4. Plans for technical assistance to be provided in 1980 and beyond were reviewed and revised as reported in Part Four.

IV. Commodities

Orders were placed for eight of ten jeeps projected for procurement under the Project. Delivery in the U.S. was promised for late November, and they were expected to arrive in Sri Lanka in mid-February. A review of the Project Grant Agreement revealed that the Government of Sri Lanka is to provide other types of vehicles designated for the Project. Funds for such are not provided in the 1980 GSL budget, however.

Procurement of equipment during the reporting period was limited to small items brought by technicians for use in carrying out their assignments, plus office equipment required for the field office to supplement that provided by the PGIA. However, previously prepared lists of needed equipment were reviewed and updated in anticipation of major procurement activity in mid-1980 (see Part Four).

Table 4. Technical assistance provided in Sri Lanka to the PGIA/Faculty under the AED Project during the period 29 April - 31 December 1979.

Name	Affil- iation*	Assignment		Date of arrival	Date of Departure
		Field	Duration		
Howard E. Ray	AED	Chief of Party	3 yrs	7/03	---
H. James Miller	AED	Facilities planning	6 wks	7/09	8/19
Frank C. Gwazdauskas	VPI	Environ. physiology	2 mos	8/11	10/07
William G. Downs	PSU	Experiment farm dev.	2 yrs	8/26	---
E. T. Kornegay	VPI	Mono. nutrition	3 wks	8/30	9/22
Robert L. Pienkowski	VPI	Entomology	6 wks	8/30	10/16
Thomas J. Marlowe	VPI	Animal breeding	6 wks	8/30	10/11
Clive R. Harston	TAMU	Agric. marketing	2.5 mos	9/15	12/05
Roy E. Blaser	VPI	Agrostology	6 wks	9/26	11/13
Michael Kosztarab	VPI	Entomology	6 wks	10/06	11/17
Eldridge C. Collins, Jr.	VPI	Waste management	6 wks	10/11	11/24

* AED - Academy for Educational Development.

VPI - Virginia Polytechnic Institute and State University.

PSU - The Pennsylvania State University.

TAMU- Texas A&M University.

NOTE: Mr. Alexander Greeley, in Sri Lanka 5 weeks during period 10/04-11/10, is not included in the above or in person-months of technical assistance effort as his work was primarily related to assistance in organization of the Project field office.

V. Library

Progress in development of the PGIA library during the first reporting period was disappointing due largely to difficulties encountered by the PGIA in filling the vacant assistant librarian position.

The PGIA and Faculty of Agriculture agreed to integrate their libraries into a single library to be housed temporarily in the PGIA building (plans call for construction of a new library within the next few years). Such integration should result in better library services for the undergraduates, postgraduates and staff. Implementation has been delayed, however, until the new assistant librarian is in place. Penn State, the Consortium's lead university for library development, early identified a senior member of its senior library staff to serve as consultant in the AED Project. In the absence of a Sri Lankan counterpart, however, it was not deemed desirable to bring him to Sri Lanka. Similarly, major purchases of library acquisitions and equipment were deferred until next year.

Thus, the only visible contribution made by the AED Project toward library development during this period was the small, although significant, number of books brought to Sri Lanka by visiting professors for use in their teaching and other activities and later turned over to the library. In addition, book request lists were reviewed and updated in anticipation of the early appointment of an assistant librarian and initiation of an acquisitions program.

VI. Planning

A systematic review and reassessment of the AED Project designed to culminate in a revised and detailed Project Implementation Plan by late January 1980 received major attention during the last quarter of 1979. The PGIA Director, Faculty of Agriculture Dean, Departments of the Faculty, Boards of Study of the PGIA, all expatriate staff (including lecturers supported by other donors), and representatives of the four CAED consortium members were involved in this task at appropriate stages. In general terms, the procedure was as follows:

1. Development of overall parameters and procedures by PGIA Director, FA Dean and Chief of Party;
2. Meetings of the above with each department;
3. Review and revision by each department of programmed technical assistance, participants for training, and requested equipment; and identification of additional high priority needs not presently included in the Project;
4. Follow-up meeting with PGIA coordination committee to clarify and refine departmental reports;
5. Meeting in Washington of Chief of Party with Consortium and Campus Coordinators to present and discuss proposed revisions;
6. (Projected for early January) Feedback from Consortium concerning recommendations for revisions or additions to the Project Plan.

The results of this intensive planning activity are presented in Part Four.

In addition to the above, and the facilities planning described in Section II, planning of various types ranging from curriculum reviews to research project designs was in progress in the PGIA and Faculty throughout the reporting period. AED Project technicians participated significantly in this process.

VII. Administration and Management

The PGIA Director, Faculty of Agriculture Dean and AED Project Chief of Party worked in close association in the implementation and management of the Project. The USAID Project Manager was kept fully

informed, and the USAID Mission provided strong support during this critical stage of the Project.

In compliance with the present Higher Education Act, The University Grants Commission drafted a new Ordinance to govern the PGIA to become effective in January 1980. The Commission held a hearing at the PGIA to obtain comments and suggestions of interested parties. Written comments were also solicited. The Chief of Party met periodically with the Chairman of the Commission to keep him apprised of Project activities. The PGIA Director and Agricultural Faculty Dean maintained frequent communication relating to the Project with the Vice Chancellor and other University authorities as well as with the University Grants Commission.

The AED Project field office was established in two rooms of the PGIA building assigned by the PGIA Director. Administrative, secretarial and accounting functions for the Project were being performed at the year's end by a staff of three fulltime and one parttime Sri Lankan employees under the overall supervision of the Chief of Party.

Securing housing required for long and short term expatriate technicians brought to Sri Lanka under the Project was a time-consuming activity during the current reporting period. By the end of the year, however, a short term house and two houses for long term technicians were being occupied, and another long term house was nearly ready for occupancy.

VIII. Other Activities and Inputs

The Project Director and Co-Director, Professors T. Jogaratnam and T.D.A. Senanayake, made their first trip to the U.S. under the Project in June 1979. During their two-week stay, they visited the campuses of Pennsylvania State University, Texas A&M, and Virginia Tech, and the offices of the Academy for Educational Development. They also conferred with relevant officials in AID and in the Sri Lankan Embassy.

No travel extensions for PGIA/Faculty Staff travelling under other auspices were administered during the reporting period.

IX. Reports

Field office reports prepared through December 31, 1979, were as follows:

<u>Report No.</u>	<u>Date</u>	<u>Title</u>	<u>Author</u>
PR79-1	7/79	AED Progress Report (Apr.-June 1979)	Howard E. Ray
PR79-2	8/79	AED Progress Report (July 1979)	Howard E. Ray
PR79-3	10/79	AED Progress Report (Aug. 1979)	Howard E. Ray
PR79-4	11/79	AED Progress Report (Sept. 1979)	Howard E. Ray
PR79-5	11/79	AED Progress Report (Oct. 1979)	Howard E. Ray
PR79-6	12/79	AED Progress Report (Nov. 1979)	Howard E. Ray
Q79-3	11/79	AED Quarterly Report (July-Sept. 1979)	T. Jogaratnam & H.E. Ray
EOT79-1	8/79	Facilities Planning	H. James Miller
EOT79-2	9/79	Monogastric Nutrition	E.T. Kornegay
EOT79-3	10/79	Environmental Physiology	Frank C. Gwazdauskas
EOT79-4	10/79	Animal Breeding	Thomas J. Marlowe
EOT79-5	10/79	Entomology	Robert L. Pienkowski
EOT79-6	11/79	Agrostology	Roy E. Blaser
EOT79-7	11/79	Entomology	Michael Kosztarab
EOT79-8	11/79	Agricultural Engineering	Eldridge C. Collins, Jr.
EOT79-9	12/79	Agricultural Marketing	Clive R. Harston
SR79-1	12/79	Meewatura Farm Development	William G. Downs

Report No. Code: PR = Progress Report
Q = Quarterly Report
EOT = End of Tour Report
SR = Special Report

PART FOUR

PLAN OF IMPLEMENTATION

The Agricultural Education Development (AED) Project Operational Plan of March 1979, was the result of a series of studies and discussions designed to identify, clarify and define more precisely the developmental needs of the Postgraduate Institute of Agriculture and Faculty of Agriculture of the University of Peradeniya. Overall, it is still sound and continues to serve the Project well. Two years have passed, however, since the needs to which it responds were identified and articulated. In the interim, the situations of these two institutions and their futures have changed somewhat; and six months of Project operation have revealed the need for further refinement and a few in-course corrections. It is highly appropriate, therefore, that this Plan now be subjected to careful review and revision as called for in Contract No. AID/ASIA-C-1397 for the AED Project.

The revised plan presented in the sections which follow has been developed through extensive interaction both at Peradeniya and on the home campuses and offices of the CAED Consortium members. (see Part Three, Section VI). It is tentative in the sense that numerous uncertainties still exist concerning the extent to which new facilities can be provided on schedule, additional resources will be made available for institutional operation and development, assistance from other donor agencies may be forthcoming and so on. It is firm in the sense that it represents the consensus of the PGIA/FA and Consortium members at this point as to the most judicious manner in which to utilize resources available to the Project, and indicates areas in which additional resources may be required to achieve all objectives of the Project.

Key people involved in finalization of the Plan during working sessions of the CAED Consortium Council Meeting held at the PGIA on February 7-8, 1980, are listed in Appendix A.

I. Administration and Management

A. PGIA/Faculty of Agriculture

A new Ordinance for governing the PGIA, promulgated in 1979 in accordance with the new Higher Education Act, was gazetted in December. Although the new Ordinance differs in several important details from the earlier one, the basic structure and relationship to the University of Peradeniya are expected to continue without major disruption.

Prof. T. Jogaratnam, PGIA Director for nearly two years, has been named as the first Director of the Institute under the new Ordinance, thus assuring continuity in leadership. With the projected growth in students and programs of the PGIA, the Director will require the assistance of new administrative staff as specified in Implementation Letter No.1 - Assistant Treasurer and Senior Assistant Registrar. The Assistant Treasurer has recently taken position, and the other position is expected to be filled in early 1981.

An additional post of Assistant Registrar is needed in the Faculty of Agriculture to handle the increased workload resulting from increasing undergraduate enrollments. A request for that position will be made in the 1981 budget estimate. Although cadre positions currently exist for secretarial assistance in the Departments, difficulty has been experienced in obtaining competent people. The Faculty will take appropriate steps to improve that situation as rapidly as possible.

B. Consortium inputs

The Chief of Party position will be extended through 1982 on a fulltime basis, with the number of person months per year beyond that date to be reassessed at that time. Contingent upon availability of resources, the current projection is for an increase in total person months for this position from 35 to 52 (see Figure 8). The need for this increased level of effort results from the major redistribution of technical assistance (see Section IV) and some spreading out of other Project inputs during the remaining years of the Project.

The need for reviewing, revising and/or planning PGIA/FA curricula, and research and outreach programs (i.e. academic planning) has been highlighted by a number of visiting staff during the past six months, as well as by the Consortium Deans and Project Coordinators during the recent Council meetings. The PGIA and FA are also cognizant of this need and have already undertaken activities in this regard as described in Section VIIIA. To advance this effort, the Head of the Crop Science Department requested that Dr. James Starling, Head of Agronomy at Penn State, come to Peradeniya to assist in planning for the crop sciences (Departments of Crop Science, Agricultural Chemistry and Agricultural Biology).

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The Head of the Department of Agricultural Engineering has requested similar assistance from the Head of Agricultural Engineering at VPI. Due to the extended void in food science and technology during the absence on sabbatical of the lecturer in that area, coupled with pressure to strengthen that division rapidly, the Head of the Agricultural Chemistry Department has urgently requested assistance from the Head of Food Science at Penn State in planning for near and longer term development of the Food Science and Technology division. Included would be more precise statements of technical assistance needed in that field.

From the standpoint of both the Consortium universities and the PGIA/FA, the Project will be best served by Consortium university administrators who have a sound understanding of both the PGIA/FA situation and needs. That understanding, vital to obtaining a full and unqualified commitment, can be gained best through first hand acquaintance with PGIA/FA administrators and staff, as well as with problems and potentials.

To respond to both of the above types of needs, up to six person-months of effort from appropriate CAED university administrators are projected. At least three person-months will be used for the department head visits identified above. The remaining three person-months may be utilized for one three-month assignment of a senior administrator to assist in academic planning at the level of the institution depending upon reassessment of needs later this year (1980).

C. Indicated action

1. Appointment of Senior Assistant Registrar for the PGIA; by early 1981.
2. Creation of new position of Assistant Registrar for FA; to be requested for 1981.
3. Filling of Secretary/typist positions with competent staff; continuing.
4. Extension of Chief of Party position; finalized by early 1981.
5. Identification and scheduling of selected Consortium university administrators to assist in PGIA/FA academic planning; 1980-81.

II. Facilities Planning and Development

A. Agricultural subcampus

The Government of Sri Lanka is committed through the Project Grant Agreement to contribute Rs. 10,151,000 for additional on-campus buildings and furniture. The combination of continuing inflation and the need for certain specialized facilities will unquestionably result in escalating costs of construction, furnishings and equipment.

The following schedule of construction is called for in Implementation Letter No.1:

<u>Building</u>	<u>Completion Date</u>
Ag. Engineering - field lab and general workshop	End CY 1980
Ag. Biology - laboratory, greenhouse, insectory	End CY 1981
Ag. Chemistry -	End CY 1981
Animal Husbandry - nutrition lab, animal unit, animal prod./proc.	End CY 1981
Crop Science - renovation of Ag.Faculty buildings	End CY 1982
- various off-campus buildings and improvements	End CY 1981

The above schedule is now considered unrealistic due to: 1) limitations on funds immediately available; 2) time required for development of a master plan for the subcampus, and design of buildings to be constructed or renovated; and 3) current scarcities in Sri Lanka of both construction materials and qualified contractors, resulting at least part from requirements of development projects already in progress.

As of early 1981, Rs. 5,480,000 has been authorized for on-campus construction, of which Rs. 1,500,000 are currently available. This will be sufficient to undertake design and construction of an agricultural biology complex to meet present needs of the Departments of Agricultural Biology and Agricultural Chemistry, and (temporarily) urgent laboratory requirements of Animal Husbandry. An architectural firm has been engaged, preliminary design sketches are expected by May 1980 and working plans by September; construction is projected to begin in late 1980 or early 1981. Barring unforeseen circumstances, the building is expected to be ready for occupancy by mid 1982. Renovation of the present Crop Science building is programmed for the current year (1980), with completion of first phase renovations expected by mid-1981.

Planning and design of additional major construction and renovation will be linked to development of an agricultural subcampus master plan projected for completion by the end of 1980. The architectural firm engaged for the biology complex cited above is expected to provide leadership to this development, but major involvement of PGIA/FA administrators and staff will also be required. Basic resources to be utilized will include the presently projected FA building program, the two facilities reports by Miller (AED Project reports EOT 79-1 and EOT 80-3), and other relevant materials developed by the Department in collaboration with Miller. Revised construction schedules and updated estimates of construction and furnishings costs will be prepared on the basis of

the new master plan.

The Project's consultant on facilities planning will be utilized for continuing periodic consultation with the Faculty and the architectural firm through at least 1982. This is expected to include approximately one trip to Sri Lanka per year plus some time in U.S. working on materials sent to him for review and comment (see Figure 8).

B. First year unit (Maha Illuppallama)

First year undergraduate students are trained for approximately six months in the University unit at Maha Illuppallama before coming to Peradeniya. They also receive training at a farm machinery training center and on a tea estate near Kandy to round out their first year program (see Section VIII). Present facilities are inadequate to accommodate the projected increase in annual intake of students; and plans are in progress to add to them.

The academic program for first year students is currently under review. Any significant changes in that program or in the use of farm facilities associated with the unit could affect the kinds and extent of new facilities required. Therefore, planning for facilities improvement at Maha Illuppallama will be linked closely with planning for the academic program.

C. Indicated action

1. Development of master plan for agricultural sub-campus; by end of 1980.
2. Design and construction of agricultural biology complex to house Agricultural Biology, Agricultural Chemistry, and part of Animal Husbandry; construction to start by early 1981.
3. Determination of revised construction schedules and costs for agricultural subcampus development based on new master plan; to be completed by March 1981.
4. Scheduling visits and work in U.S. by Project facilities planner to minimize costs and maximize effectiveness; 1980-81.
5. Planning for Maha Illuppallama unit linked to academic planning for first year Faculty of Agriculture students; 1980-81.

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III. Training

The need for training fifty or more additional staff members to the PhD level, identified in the 1977 Faculty of Agriculture Five Year Plan, was supported in the Preliminary Assessment and Project Paper which followed. Of these, Project Paper projections included 38 to be trained under the AED Project and 16 others through scholarships from other donor agencies (see Table 5 below). The Project Grant Agreement likewise called for 38 to be trained under this Project.

Table 5. Summary of scholarships for PhD training of junior Faculty of Agriculture staff as projected in Project Paper for AID Project 383-0049.

Department	No. of scholarships		
	AED Project	Other donors	TOTAL
Crop Science	8	3	11
Agricultural Chemistry	5	2	7
Agricultural Biology	7	3	10
Agricultural Economics/Extension	6	2	8
Animal Husbandry	5	3	8
Agricultural Engineering	6	3	9
Unspecified	1	-	1
TOTAL	38	16	54

Developments since 1977 have resulted in some uncertainty as to the adequacy of the number of scholarships presently authorized under the AED Project. Several staff then abroad for postgraduate training were supported only to the Masters level. The number of postgraduate scholarships available from all sources has apparently decreased, and fewer permit continuation through the PhD. The British Council is following through on plans to provide about eleven scholarships, however, which will help to ease this situation. Even so, it may be necessary to add two to three additional participants to the AED Project authorization, depending upon the response of other donors to PGIA/FA.

Some redistribution of disciplines within departments, an increase of up to two participants over the life of the Project, and revised estimates of numbers to start training each year are now projected. The March 1979 operational plan called for the departure of 21 participants in 1979 and 17 in 1980 (see Table 1). For reasons discussed in Part Three, Section I, that has now been revised to: 14 in 1979-80, 17 in 1980-81, and 7-9 in 1981-82.

A. Norms for completion of PhD training

Some confusion existed earlier concerning the period of time required for participants under the Project to complete their PhD training. A part of that confusion arose from the fact that, although the majority of the

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participants will hold only baccalaureate degrees at the time they enter such training, a significant number will already possess Masters degrees (usually from foreign universities).

The following norms, acceptable to both the PGIA/FA and CAED Consortium universities, will become effective immediately to minimize future misunderstandings in this regard:

a. For participants starting with BSc degree:

1. Thirty to 36 months at U.S. university to obtain Masters (if required) and complete coursework for PhD.
2. Eighteen months in Sri Lanka for PhD dissertation research.
3. Six months back at U.S. university to write and defend thesis.

b. For participants starting with MSc degrees:

1. Eighteen to 24 months at U.S. university to complete coursework for PhD.
2. Eighteen months in Sri Lanka for dissertation research.
3. Six months back at U.S. university to write and defend thesis.

It is, of course, recognized that a few participants will complete in less time than indicated above and a few others may require somewhat more. Nevertheless, these norms will be used by the PGIA/FA in candidate selection to assure that their nominees have adequate study leave available, by the Consortium universities in planning each participant's study program, and by the Project in scheduling technical assistance assignments to synchronize with participants' dissertation research.

The head of a Consortium University department in which a participant is majoring will be expected to inform his campus coordinator of the estimated dates for completion of each of the three phases indicated above no later than the end of that participant's first academic year in residence. That information will be forwarded to the Project field office through the Consortium Coordinator. In the event that a study leave extension is required, it will be the responsibility of the participant to make application for same as far in advance as possible.

B. Supervision of dissertation research

The 1979 Plan indicated that participants would be supervised while in Sri Lanka by visiting staff in their specialties. Two additional factors must be taken into consideration, however, in establishing definitive procedures for graduate research supervision that are both feasible and appropriate. First, it will not be possible under the present Plan to schedule staff assignments to meet the research supervision needs for all returning participants. Second, senior PGIA/FA staff are fully competent to direct graduate student research in a number of disciplines, and should be involved in same to assure that participant research is integrated into the PGIA program as well as relevant to Sri Lankan needs.

In recognition of the foregoing, co-advisors will be designated for each participant. The senior advisor will be from the U.S. university in which the participant takes his/her course work and which will award the degree. The co-advisor will be a senior member of the PGIA staff charged with responsibility to help plan the research in association with the participant and his/her U.S. advisor, and to supervise that research in Sri Lanka in the absence of the U.S. advisor.

Three way interaction among the participant and the two advisors will be critical at two points - for design and initiation of the research and for defence of the dissertation. Such interaction will be achieved through one of the avenues listed below:

1. Design and initiation of dissertation research

- a. Visiting staff arrangements will be synchronized with participants' return to Sri Lanka insofar as possible.
- b. A visiting professor in a related discipline from any of the three Consortium universities may be asked to substitute in Sri Lanka for the U.S. advisor.
- c. If neither of the above is possible, the U.S. advisor will be authorized to spend up to two weeks in Sri Lanka to work with the participant and PGIA co-advisor in getting the research underway.

2. Defence of thesis

- a. The PGIA co-advisor will be authorized transportation to the U.S. university to participate in the thesis defence, provided that:

- * The PGIA advisor has provided sole or principal direction to the research;
- * The PGIA advisor has not previously traveled to the U.S. for this purpose.

It is likely that some senior PGIA/FA staff will serve as co-advisor for more than one participant. In such cases, final examinations will be grouped wherever possible. Where that cannot be done, it is postulated that participation in the thesis defence of the first participant working under his/her direction will permit the PGIA/FA advisor to become familiar with policies and procedures of the U.S. counterpart department. Equally important, the PGIA and U.S. faculty members can establish close working relationships. For subsequent participants, it is expected that the PGIA advisor can participate effectively on participants' committees through contact with the U.S. advisor while in Sri Lanka and subsequent correspondence.

To implement the above policy, the head of each department in a Consortium university in which an AED Project participant is registered will be expected to provide his campus coordinator with the following information concerning each participant as early as possible, but no later than one year in advance of completion of coursework:

1. Major advisor
2. General nature of proposed dissertation research
3. Expected date for completion of coursework

When this information is received in the field, the PGIA will nominate a co-advisor and comment on the appropriateness of the proposed research. The PGIA and Project field office, working in collaboration with the Consortium coordinator, will also review projected visiting staff assignments and recommend the procedure to be followed, including possible shifts in timing of technical assistance assignments.

C. Allocations by department

Present projections for allocation of participant slots to the six departments generally follow those of the Project Paper. Some redistribution of disciplines within departments and adjustments in time have been made, however, as discussed below.

1. Crop Science. Eleven participants representing the various disciplines in crop science were identified in the Project Paper, eight of whom were projected for training under the AED Project (see Table 5). As shown in Table 6, the number remains unchanged in current projections, although there are some shifts in disciplines and timing of departure.

Table 6. CROP SCIENCE; comparison between Project Paper and current (2/80) projections for PhD training to be provided under AED Project.

Discipline	Scheduled starting date	
	Project Paper	Current
Agroclimatology	1979	1980
Cropping patterns and systems	1979	1980
Seed physiology	1979	1980
Stress physiology	1980	1981
Growth physiology	1980	--
Postharvest physiology	1980	1981
Weed science/growth regulators	1980	1979
Crop ecology	1980	--
Horticulture/floriculture	--	1981
Forestry/pomology	--	1980

The assistant lecturer who entered postgraduate training in August 1979 is expected to return to Sri Lanka by spring 1981 to undertake his dissertation research. Four participants will be nominated to start their training in fall 1980, according to present plans of the department.

2. Agricultural Chemistry. Both the Project Paper and this Plan project PhD training for five participants under the AED Project and two to be financed by other donors (see Table 5). Some redistribution is now projected, however, as indicated in Table 7 below.

Table 7. AGRICULTURAL CHEMISTRY; comparison between Project Paper and current (2/80) projections for PhD training to be provided under AED Project.

Discipline	Scheduled starting date	
	Project Paper	Current
Soil physics	1979	1980
Food preservation	1979	1979
Soil morphology/classification	1980	1980
Soil/plant nutrition	1980	--
Food analysis	1980	1980
Soil microbiology	--	1981

Two of the five participants are already in positions as assistant lecturers and have entered training under the Project. The other three slots will probably be filled with newly recruited staff. Two of these (soil physics and morphology/classification) are expected to start in 1980, and the other (soil microbiology) in 1981. The two scholarships projected for other donor financing, one each in soil chemistry and food nutrition, are urgently needed to provide a balanced staff to the department.

3. Agricultural Biology. Project Paper projections included PhD training for ten assistant lecturers in Agricultural Biology, seven of which would be funded through the AED Project, and the remaining three by other donors (see Table 5). The projection for three scholarships to be funded by other donors remains unchanged. Some redistribution among disciplines and times of departure, and a possible net addition of two participants are now projected, as shown in Table 8.

4. Agricultural Economics and Extension. The equitable allocation of scholarships within this department is rendered more difficult by the necessity to develop balanced staff in the two distinct areas of agricultural economics and extension education. The Project Paper called for six junior staff (equally divided between economics and extension) to receive PhD training under the AED Project and two more, in rural sociology and extension, to be funded by other donors. The combination of increasing demand on the PGIA to provide training in extension and adult education-related fields, the loss of at least one staff member in agricultural economics, and reconsideration of the best means for meeting agri-business management needs, has forced a reassessment of need and redistribution among disciplines as indicated in Table 9. Also, current projections call for two additional scholarships, one each for the AED Project and another donor. The addition under the AED Project will fill the "unspecified" slot shown in Table 5.

One of the junior lecturers from this department entered training under the Project in August 1979, another started in January 1980, and two more are scheduled to begin in May 1980. The remaining three are expected to begin as indicated in Table 9.

Table 8. AGRICULTURAL BIOLOGY; comparison between Project Paper and current (2/80) projections for PhD training to be provided under AED Project.

Discipline	Scheduled starting date	
	Project Paper	Current
Crop botany	1979	--
Crop botany	1979	--
Genetics/crop botany	1979	1979
Biological control (entomology)	1979	1979
Virology	1979	1980
Insect ecology	1980	1979
Crop physiology	1980	1980
Systematic botany	--	1981 (?)
Plant breeding (legumes)	--	1980
Insect ecology	--	1981 (?)
Plant breeding (cereals)	--	1980

Note: It is anticipated that the two scholarships projected for 1981 will be picked up by the British Council. If not, they represent a net addition of two places for which additional funding may be requested.

Table 9. AGRICULTURAL ECONOMICS AND EXTENSION; comparison between Project Paper and current (2/80) projections for PhD training to be provided under AED Project.

Discipline	Scheduled starting date	
	Project Paper	Current
Agricultural extension	1979	1980
Agri-business management	1979	--
Agri-business management	1980	--
Marketing	1980	1979
Rural sociology	1980	1980
Communications	1980	1980
Production economics	--	1980
Agricultural education	--	1980
Agricultural finance	--	1981

5. Animal Husbandry. Eight animal husbandry scholarships distributed among six disciplines were identified in the Project Paper, of which five were projected for the AED Project and three for other donors (Table 5). Although the number remains unchanged (see Table 10), minor fields have been designated in some cases, and one discipline substitution has been made.

Table 10. ANIMAL HUSBANDRY; comparison between Project Paper and current (2/80) projections for PhD training to be provided under AED Project.

Discipline	Scheduled starting date	
	Project Paper	Current
Genetics ^{1/}	1979	1980
Animal physiology ^{1/}	1979	1980
Monogastric nutrition	1979	1979
Agrostology	1980	1979
Animal product ^{2/} technology	1980	--
Agrostology ^{2/}	--	1980

^{1/} To minor in agrostology/ruminant nutrition.
^{2/} To minor in agroclimatology or related field.

Two assistant lecturers entered training under the Project in September 1979; the remaining three are expected to start during the 1980 academic year. Three scholarships projected for other donor financing are in the fields of dairy science and animal product technology (2).

6. Agricultural Engineering. Staffing requirements of this department have been reviewed and revised in accordance with results of a recently completed reassessment of departmental priorities. In consequence, although the total number scheduled to receive PhD training in agricultural engineering under the Project remains unchanged at six, some changes in composition are now projected (see Table 11).

Four staff are now projected to receive training through other donor financing, an increase of one from the Project Paper estimates. The major-minor combinations indicated in Table 11 are included to prevent voids in these disciplines should there be a delay in receiving scholarships from other donors.

All Agricultural Engineering participants scheduled to enter training in 1979 and 1980 have been identified and are in position. Two will have completed Master's degrees prior to initiation of their training through AED. One, scheduled for departure in 1981, is still to be recruited.

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Table 11. AGRICULTURAL ENGINEERING; comparison between Project Paper and current (2/80) projections for PhD training to be provided under the AED Project.

Discipline	Scheduled starting date	
	Project Paper	Current
Irrigation/conservation	1979	--
Water management	1979	--
Agricultural structures <u>1/</u>	1979	1980
Dairy engineering	1979	--
Waste management	1979	1979
Processing	1980	--
Watershed hydrology	--	1979
Tillage	--	1981
Farm machinery <u>2/</u>	--	1980
Soil conservation <u>3/</u>	--	1980

1/ Expected to minor in dairy engineering.

2/ Expected to include machinery testing and evaluation also.

3/ Expected to minor in drainage engineering.

D. Indicated action

1. Identification, nomination, processing and entry of participants into PhD training according to schedule presented in Table 12.
2. Determination and periodic updating of training schedule for each participant in accordance with norms given in Section IIIA.
3. Preparation of plan for supervision of dissertation research for each participant, utilizing guidelines presented in Section IIIB.
4. Periodic review and updating of projections for training costs in accordance with revised plan; and submission of requests for supplemental funding, if necessary.

Table 12. Schedule of projected assistant lecturer entries into PhD training, by discipline.

Department	Academic year of entry			TOTAL
	1979-80	1980-81	1981-82	
Crop Science	Weed sci./growth regulators	Agroclimatology Cropping systems Seed physiology Forestry/pomology	Stress physiology Postharvest physiology Horticulture/floriculture	8
Agricultural Chemistry	Food preservation Food analysis	Soil physics Soil morphology/classif.	Soil microbiology	5
Agricultural Biology	Genetics/crop botany Biological control (ent.) Insect ecology	Virology Crop physiology Plant breeding (legumes) Plant breeding (cereals)	Systematic botany (?) Insect ecology (?)	7-9
Agricultural Economics and Extension	Marketing Production economics Communications Rural sociology	Agricultural education Extension	Agricultural finance	7
Animal Husbandry	Monogastric nutrition Agrostology	Genetics Animal physiology Agrostology		5
Agricultural Engineering	Waste management Watershed hydrology	Agricultural structures Farm machinery Soil conservation	Tillage	6
TOTAL	14	17	7-9	38-40

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IV. Technical Assistance

The 1979 Preliminary Assessment projected a significant technical assistance component to help meet immediate requirements until core staff could return from training, and to contribute to overall development of teaching, research and outreach programs. That concept was maintained in the Project Paper and 1979 operational plan although increased emphasis was rightly given in the latter two documents to the role of visiting staff in supervision of postgraduate research. Also, the level of effort was reduced from that projected in the Preliminary Assessment.

A. Level and distribution of effort

The 1979 operational plan called for approximately 22 person years of technical assistance over the seven year life of the Project. Those projections have now been reviewed and updated, taking into consideration:

- (1) priorities of need;
- (2) synchronization of assignments with the participants' return to Sri Lanka for dissertation research;
- (3) availability of counterparts and essential facilities;
- (4) optimum duration of the assignment for achieving its objectives.

The updated projections anticipate a small increase in level of effort from 22.4 to 23.7 person years (269 to 284 p/mos.) as summarized in Table 13a. That increase is considered minimal in view of the projected redistribution of technical assistance and other inputs discussed later in this report, the number of AED Project participants who will be undertaking dissertation research in Sri Lanka, and the number of person years for which those participants will not be available to teach in the PGIA/FA (at least 100 p/yrs in total).

Projected shifts in timing of technical assistance inputs are more substantive than adjustments in level of effort as seen in Table 13b. In contrast to the 1979 Plan in which 1980 was projected to be the peak year with about 45 percent of all authorized person months to be used by the end of that year, a more uniform distribution of effort is now anticipated. The updated plan projects 1982 as the peak year, but with a reasonably uniform level of effort through each of the first five years of the Project.

Periodic reassessments will be made to assure that all assignments are synchronized with specific need, are adjusted to new developments that may emerge, and are consistent with the level of resources available. The PGIA and members of the Consortium will seek to adjust timing and duration to best accommodate both the needs of the Project and availability of desired people. Maximum possible lead time will be given to the Consortium universities to enable prospective staff to arrange their schedules so as to be available for assignments at Peradeniya.

Table 13a. Distribution of technical assistance by Department or area as projected in 1979 Plan, and in current (2/80) estimates, AED Project.

Department	Total person months	
	1979 Plan	Current
Crop Science	24	26
Agricultural Chemistry	39	39
Agricultural Biology	39	45
Agricultural Economics and Extension	52 ^{1/2}	52 ^{1/2}
Animal Husbandry	25 ^{2/2}	25 ^{2/2}
Agricultural Engineering	19 ^{2/2}	16 ^{2/2}
Administration/Management	62	81
Unspecified	9	--
TOTAL	269	284

^{1/} Chief of Party also projected to assist in Extension.
^{2/} Also projected to receive technical assistance from U.K.

Table 13b. Distribution of technical assistance by year as projected in 1979 Plan, and in current (2/80) estimates, AED Project.

Year	Person months per year	
	1979 Plan	Current
1979	44	24.5
1980	76	56.5
1981	73	63.5
1982	47	67.5
1983	18	65.0
1984	1	3.0
1985	1	4.0
Unspecified	9	--
TOTAL	269	284.0

B. Distribution by area/department/discipline

1. Crop Science. The major changes in technical assistance as currently projected for Crop Science (see Figure 2) are shifts in timing designed to bring the visiting professors to Sri Lanka during the period in which participants in those disciplines are back in the country for their dissertation research.

The most prominent of these is for the Agroclimatology assignment. The earlier projection would have permitted overlap between the visiting professor and participant before the participant's initial departure for the U.S.A. However, it would also have resulted in a complete void in this area between the visiting staff's departure and return of the participant to undertake dissertation research. After reconsideration, delay of the assignment to synchronize with the participant's return and to minimize the period in which the department would be without strength in this discipline was deemed to be the better alternative. The desirability of a long term assignment as compared to two more short term assignments in providing adequate assistance in this area will be reassessed later, and scheduling will be adjusted if and as necessary.

One additional four month assignment, in the field of horticulture (fruit crops), is projected for late 1983 or early 1984, depending upon the date of return for dissertation research of the participant in that field. With the decrease of 2 p/mos in weed science, a net increase of 2 p/mos is projected for the department.

2. Agricultural Chemistry. Although the person months of technical assistance remain unchanged from the 1979 plan, important changes in composition and timing have been made as illustrated in Figure 3. The net effect is to increase the proportion to be received by the food science and technology division.

Soil physics has been decreased by 6 p/mos to 15, and food technology is increased by a like amount from 6 to 12. Soil microbiology has replaced soil chemistry with no change in p/mos programmed. Most assignments are now programmed later in the Project than previously to facilitate supervision of participants' dissertation research and to maintain continuity of programming after visiting staff have completed their assignments.

Plans for technical assistance to the food science and technology division of the department are less well developed than for the soils division due to the prolonged absence on sabbatical leave of the senior staff in that division. The assistance of a food science administrator will be scheduled in mid-1980 (see Section 7 below) to help identify most critical needs in this division, and to develop preliminary job descriptions and most appropriate schedules for the projected assignments in this field. Consideration will be given to filling one of these assignments with a food scientist from VPI where a Project participant is presently pursuing graduate study in that field.

All assignments for the soils division of the department have been adjusted, with the exception of the initial short term soil physicist, to coincide with the return of participants to undertake dissertation research.

The soil mineralogist will be expected to provide supervision to the participant in soil morphology/classification who will have soil mineralogy as a minor.

3. Agricultural Biology. The major change in technical assistance projected for this department is an increase of nine person months in entomology to permit substitution of a one year long term assignment in integrated pest management for the earlier programmed 3-month short term. Although entomology is well-represented in the training slots, the department is completely devoid of staff in this field at present. There is critical need for the assistance of a senior entomologist to provide initial leadership to development of teaching and research programs in entomology as well as to supervise postgraduate research.

The plant breeder slot has been rescheduled for 1981-82 to synchronize with return of participants in the field, and to provide continuity to development of the plant breeding program once it is launched. It has been decreased to 3 p/mos to partially offset the additional allocation to entomology. The plant pathology assignments remain approximately as projected in the 1979 plan. Updated projections for this department are listed in Figure 4.

4. Agricultural Economics and Extension. Although the total level of effort remains unchanged from the 1979 plan, a new 10-month assignment in agricultural education has been made possible through elimination of the agri-business management slot, and decreasing communications and rural sociology by 3 p/mos each. The weighting toward the extension division of the department is justified by the relatively adequate pool of expertise in agricultural economics in Sri Lanka upon which the PGIA/FA can draw for consultation and assistance. Current projections, shown in Figure 5, will be reassessed periodically.

5. Animal Husbandry. Changes from the 1979 Plan for technical assistance to Animal Husbandry are minor as shown in Figure 6. It has been possible to increase the level of effort later in the Project to meet the need for supervision of postgraduate research as a result of the decision to cut back on assignments previously programmed for the second half of 1979.

6. Agricultural Engineering. Updated projections for technical assistance to this department vary significantly from those of the 1979 Plan as the result of a recent reassessment of plans and priorities in agricultural engineering. Water and waste management p/mos have been decreased, dairy engineering has been deleted, and three new short term assignments - traction and tillage, soil conservation engineering, and farm machinery - have been added (see Figure 7).

With respect to personnel to fill the projected assignments, it is anticipated that Prof. E.B.Hale will be nominated in place of Dr. Shanholtz for the water management position. Also, consideration will be given to obtaining agricultural engineers from Texas A&M for the soil conservation engineering and farm machinery assignments.

7. Administration/Management. In the context of this plan, the term Administration/Management includes all technical assistance that cannot be associated with a specific discipline.

The various categories of technical assistance in this general grouping are discussed in other sections: I. Administration and Management; II. Facilities Planning and Development; V. Library Development; VI. Experiment Farm Development; VIII. Institutional and Project Planning. They are herein grouped together in order that they might be examined in relation to the more specific types of assistance projected for the six Departments/Boards of Study.

The updated projections shown in Figure 8 constitute a net addition of 9 p/mos over the 62 p/mos for administration/management plus 9 p/mos unspecified indicated in the 1979 Plan. In summary, the changes are as follows:

Chief of Party:	to be extended through 1982 on fulltime basis and some increase in subsequent years to provide LOP increase of 18 p/mos (see Section I).
Facilities planner:	to be increased by one p/mo (see Section II).
Expt.farm dev.spec:	original assignment to be decreased to one year, with follow-up 3-month assignment. (see Section VI).
Librarian:	not specifically identified earlier; 3 p/mos now projected, one of which may be used for PGIA librarian trip to U.S. (see Section V).
Agricultural administrators:	new category; up to 6 p/mos projected (see Sections I, VIII).

As can be seen from Figure 8, the revised projections imply significant increases in LOP travel and transportation costs due to the larger number of separate assignments (see Section X).

C. Indicated action

1. Provision of technical assistance as projected in Figure 9 and Table 14.
2. Coordination of technical assistance with other Project inputs; continuing.
3. Continuing review of technical assistance projections, with major reassessment at least annually.

Figure 2. Technical assistance to CROP SCIENCE projected in 1979 Plan and as revised February 1980.

Assignment	p/mos	Projected timing								
		1979	1980	1981	1982	1983	1984	1985		
Agroclimatology	12 12		.....	.....		XXX	XXXXXX	XXX		
Cropping systems	6 6		... XXX		..		XXX			
Weed science	6 4			... XX			.. XX			
Horticulture (fruit crops)	0 4						XXXX			

Figure 3. Technical assistance to AGRICULTURAL CHEMISTRY projected in 1979 Plan and as revised February 1980.

Assignment	p/mos	Projected timing								
		1979	1980	1981	1982	1983	1984	1985		
Soil physics	21 15		... XXX		.....	.....	XXXXXX	XXXXXX		
Soil chemistry	6 0			...			...
Soil microbiology	6 6			..		XXX	...	XXX		
Food technology	6 12			... XXX	XXX	XXX	...	XXX		
Soil mineralogy	0 6						XXXXXX			

1979 Plan projection indicated by ; February 1980 projection indicated by XXXXXX.

Figure 4. Technical assistance to AGRICULTURAL BIOLOGY projected in 1979 Plan and as revised February 1980.

Assignment	p/mos	Projected timing						
		1979	1980	1981	1982	1983	1984	1985
Plant Breeding	27		.....	.....	.....	.....
	24			XXXXXXXXXX	XXXXXXXXXX	XXXXXX		
Entomology	6		...		...
	15		XXX		XXXXXXXXXX	XXXXXX		
Plant pathology (virology)	6			...	...	
	6			XXX	XXX			

Figure 5. Technical assistance to AGRICULTURAL ECONOMICS/EXTENSION projected in 1979 Plan and as revised 2/1980.

Assignment	p/mos	Projected timing						
		1979	1980	1981	1982	1983	1984	1985
Extension	3*				...			
	3*					XXX		
Rural sociology	27		.....	.....	.....	...
	24		XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX			
Communications	12		...		...	.....
	9		X		XX	XXXXXX		
Marketing	6		..			...
	6		XX		XXXX			
Agri-business management	4 0				...			
Agricultural education	0							
	10			XXXX		XXXXXX		

1979 Plan projection indicated by ; February 1980 projection indicated by XXXXXX.

Does not include Chief of Party contribution for whom p/mos are allocated to Administration/Management.

Figure 6. Technical assistance to ANIMAL HUSBANDRY projected in 1979 Plan and as revised in February 1980.

Assignment	p/mos	Projected timing						
		1979	1980	1981	1982	1983	1984	1985
Environmental physiology	3 3	.... XX					X	
Animal breeding	6 6	.... XX	..				XXXX	
Agrostology	9 9	.... XX		....	.... XXXX		XX	
Monogastric nutrition	3 3	.. X						
Ruminant nutrition	4 4	..	X	..	XXX			

Figure 7. Technical assistance to AGRICULTURAL ENGINEERING projected in 1979 Plan and as revised February 1980.

Assignment	p/mos	Projected timing						
		1979	1980	1981	1982	1983	1984	1985
Water management	6 3				.. XXX	....	
Waste management	8 3	.. XX	..		.... X			
Dairy engineering	5 0					....	
Traction & tillage	0 3		X				XX	
Soil conservation engg.	0 3.5						XXXX	
Farm machinery	0 3.5						XXXX	

1979 Plan projection indicated by : February 1980 projection indicated by XXXXXX.

Assignment	p/mos	Projected timing										
		1979	1980	1981	1982	1983	1984	1985				
Chief of Party	34 52	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
		XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XX	X	XXX	XX	XX
Facilities planner	4 5	.... XX	X	X	X							
Expt. farm development spec.	24 15	..... XXXX	..... XXXXXX	.....	.....	XXX						
Librarian	0 3*		X	X	X							
Crop science administrator	0 1		X									
Agric. engg. administrator	0 1			X								
Biol. sciences admin.	0 1**			X								
An. science administrator	0 1**			X								
Food science administrator	0 1		X									
Social science admin.	0 1**			X								
Unspecified	9 0											

1979 Plan projection indicated by ; February 1980 projection indicated by XXXXXX.

* May substitute trip to U.S. by PGIA assistant librarian in 1981 for Penn State librarian trip to S.L.

** May substitute one 3-month assignment of administrator to work at institutional level for these three one-month assignments.

Figure 9. Summary of technical assistance assignments as projected in February 1980.

Assignment	p/mos	Projected timing						
		1979	1980	1981	1982	1983	1984	1985
CROP SCIENCE								
Agroclimatology	12					XXXXXXX		
Cropping systems	6		XXX				XXX	
Weed science	4			XX		XX		
Horticulture (fruit crops)	4						XXXX	
AGRICULTURAL CHEMISTRY								
Soil physics	15		XXX			XXXXXX	XXXXXX	
Soil microbiology	6				XXX		XXX	
Food science & technology	12			XXX	XXX	XXX	XXX	
Soil mineralogy	6						XXXXXX	
AGRICULTURAL BIOLOGY								
Plant breeding	24				XXXXXXXX	XXXXXX	XXXXXX	XXX
Entomology	15		XXX		XXXXXX	XXXXXX		
Plant pathology (virology)	6			XXX	XXX			
AGRICULTURAL ECONOMICS AND EXTENSION								
Extension	3*						XXX	
Rural sociology	24		XXXXXXXX	XXXXXX	XXXXXX			
Communications	9		X		XX	XXXXXX		
Marketing	6		XX		XXXX			
Agricultural education	10			XXXX		XXXXXX		
ANIMAL HUSBANDRY								
Environmental physiology	3		XX				X	
Animal breeding	6		XX				XXX	
Agrostology	9		XX			XXXXX	XX	
Monogastric nutrition	3		X			XX		
Ruminant nutrition	4		X		XXX			

Figure 9. (Cont'd)

Assignment	p/mos	Projected timing										
		1979	1980	1981	1982	1983	1984	1985				
AGRICULTURAL ENGINEERING												
Water management	3				XXX							
Waste management	3	XX				X						
Traction & tillage	3		X					XX				
Soil conservation engg.	3.5							XXXX				
Farm machinery	3.5							XXXX				
ADMINISTRATION/MANAGEMENT												
Chief of Party	52	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XX	X	XXX	XX	XX
Facilities planner	5	KX	X		X		X					
Expt. farm development spec.	15	XXXX	XXXXXXXXXX				XXX					
Librarian	3**		X		X		X					
Crop science administrator	1		X									
Agric. engg. administrator	1			X								
Biol. science administrator	1 ⁺				X							
An. science administrator	1 ⁺				X							
Food science administrator	1		X									
Soc. science administrator	1 ⁺				X							

- * Does not include Chief of Party contribution for whom p/mos are allocated to Administration/management.
- ** May substitute trip to U.S. by PGIA assistant librarian in 1981 for Penn State librarian trip to Sri Lanka.
- + May substitute one 3-month assignment of administrator to work at institutional level for these three one-month assignments.

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Table 14. Annual level of technical assistance effort as projected February 1980.

Department	Assignment	Person months							TOTAL
		1979	1980	1981	1982	1983	1984	1985	
Crop Science	Agroclimatology	0	0	0	3	9	0	0	12
	Cropping systems	0	3	0	0	3	0	0	6
	Weed science	0	0	2	0	2	0	0	4
	Hort. (fruit crops)	0	0	0	0	4	0	0	4
Agricultural Chemistry	Soil physics	0	3	0	6	6	0	0	15
	Soil microbiology	0	0	0	3	3	0	0	6
	Soil mineralogy	0	0	0	0	6	0	0	6
	Food technology	0	3	3	3	3	0	0	12
Agricultural Biology	Plant breeding	0	0	9	12	3	0	0	24
	Entomology	3	0	6	6	0	0	0	15
	Plant pathology	0	3	3	0	0	0	0	6
Agricultural Economics and Extension	Extension	0	0	0	0	3	0	0	3
	Rural sociology	0	12	12	0	0	0	0	24
	Communications	0	1	2	6	0	0	0	9
	Agric. education	0	4	0	3	3	0	0	10
	Marketing	2.5	0	3.5	0	0	0	0	6
Animal Husbandry	Environ. physiology	2	0	0	0	1	0	0	3
	Animal breeding	1.5	0	0	0	4.5	0	0	6
	Agrostology	1.5	0	0	5	2.5	0	0	9
	Mono. nutrition	1	0	0	2	0	0	0	3
	Rum. nutrition	0	1	3	0	0	0	0	4
Agricultural Engineering	Water management	0	0	3	0	0	0	0	3
	Waste management	1.5	0	0	1.5	0	0	0	3
	Traction & tillage	0	1	0	0	2	0	0	3
	Soil conser. engg.	0	0	0	0	3.5	0	0	3.5
	Farm machinery	0	0	0	0	3.5	0	0	3.5
Admin./ Management	Chief of Party	6	12	12	12	3	3	4	52
	Facilities planning	1.5	1.5	1	1	0	0	0	5
	Expt. farm dev.	4	8	0	3	0	0	0	15
	Library	0	1	1	1	0	0	0	3
	Crop sci. admin.	0	1	0	0	0	0	0	1
	Agric. engg. admin.	0	1	0	0	0	0	0	1
	Biol. sci. admin.	0	0	1	0	0	0	0	1
	An. sci. admin.	0	0	1	0	0	0	0	1
	Food sci. admin.	0	1	0	0	0	0	0	1
	Soc. sci. admin.	0	0	1	0	0	0	0	1
TOTAL		24.5	56.5	63.5	67.5	65	3	4	284

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V. Library Development

As stated in the 1979 Plan, the Contractor will "Assist in the planning and implementation of a library development program, including a systematic acquisition program; and arrange for purchase and delivery to the University of needed equipment and library acquisitions". Approximately \$10,000 for equipment and \$375,000 for acquisitions were projected for such assistance.

Although not specifically identified as a short term assignment, library development was cited in the Plan as one of the areas for which assistance might be required. As shown in Figure 8, a librarian has been included in the list of visiting staff as now projected. A senior member of the Penn State library staff has been designated to fill that assignment (Penn State is the Consortium's lead university for library development).

Implementation of the Project's library development component has been seriously delayed, pending appointment of an assistant librarian to be in charge of the PGIA library. It is now expected that this position will be filled by late March 1980. Based on that assumption, the library consultant is programmed to spend April at Peradeniya, with repeat visits projected for 1981 and 1982. His primary function will be to help establish systems and procedures for identifying needs, and purchasing, receiving, handling, and cataloging acquisitions.

Although, as indicated above, present projections call for three visits to Sri Lanka by the visiting librarian, the 1981 visit may be reversed. That is, it may prove more desirable for the PGIA librarian to travel to the U.S. instead of bringing the U.S. librarian to Sri Lanka that year.

A. Merging of PGIA and FA libraries

The PGIA and Faculty of Agriculture took the decision in late 1979 to merge their separate libraries in the interests of increasing efficiency and providing better service to the users. Early implementation of that decision has been urged by all visiting staff.

The combined library is to be housed temporarily in the PGIA building. With only minor modifications as shown in Figure 10, available space should be adequate to serve the PGIA and FA for several years. (Long range plans call for construction of a new library within the next five years to meet the expanding needs of the institution).

B. Scheduling of acquisitions

Purchasing of acquisitions will proceed at an accelerated rate during the next two or three years for two overriding reasons.

The collection of reference works, journals, etc., in the present agricultural library is woefully inadequate for meeting the needs of students and staff. This deficiency is a major constraint to improvement in the quality of both undergraduate and postgraduate education. If continued indefinitely, such a situation will both result in reduced credibility of this institution

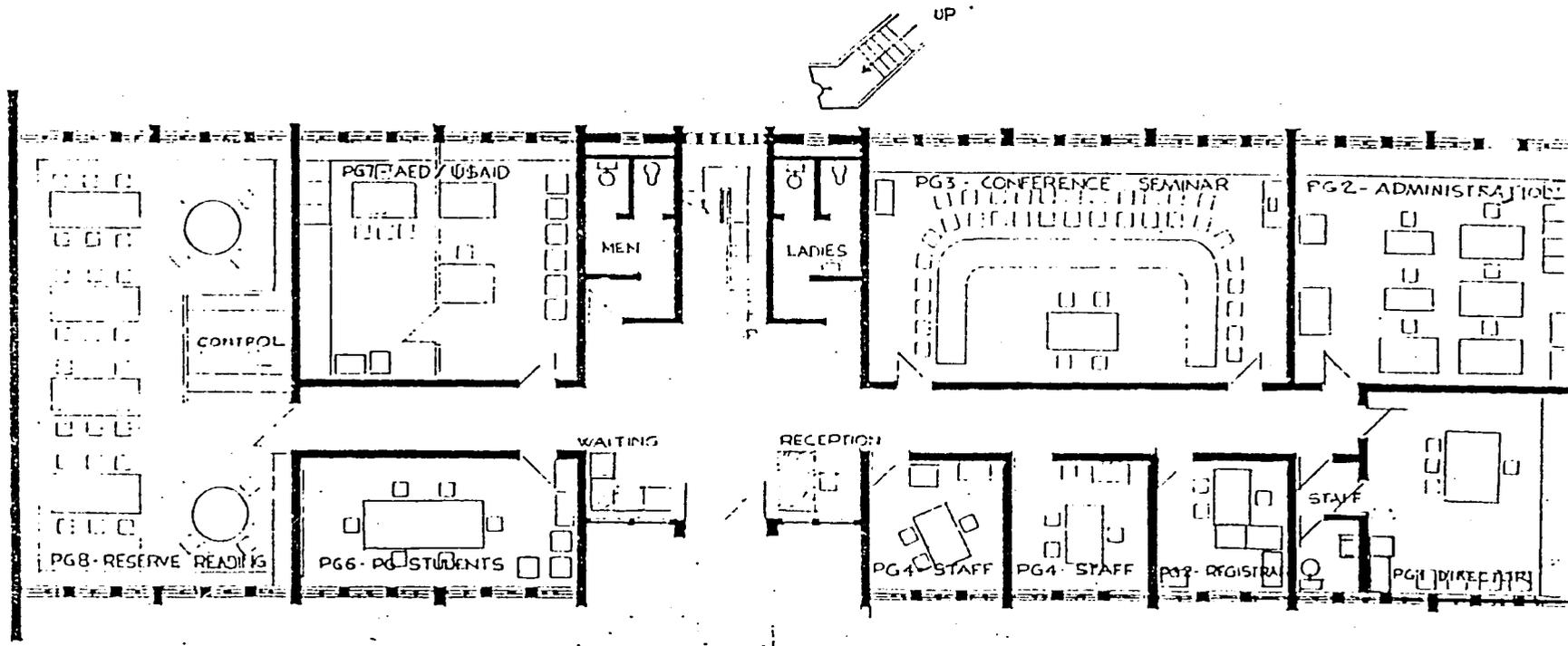
and jeopardize the planned expansion in FA and PGIA enrollments.

The decreased purchasing power resulting from continued rapid inflation constitutes a second strong justification for accelerating the rate of purchase of library acquisitions. As the consequence of inflation which has already occurred, current funding levels will permit purchase of only a fraction of the volumes projected in the Project Paper and 1979 Plan.

Extensive lists of needed books, journals, etc., already submitted by the departments and visiting staff will serve as the basis for early initiation of procurement.

C. Indicated action

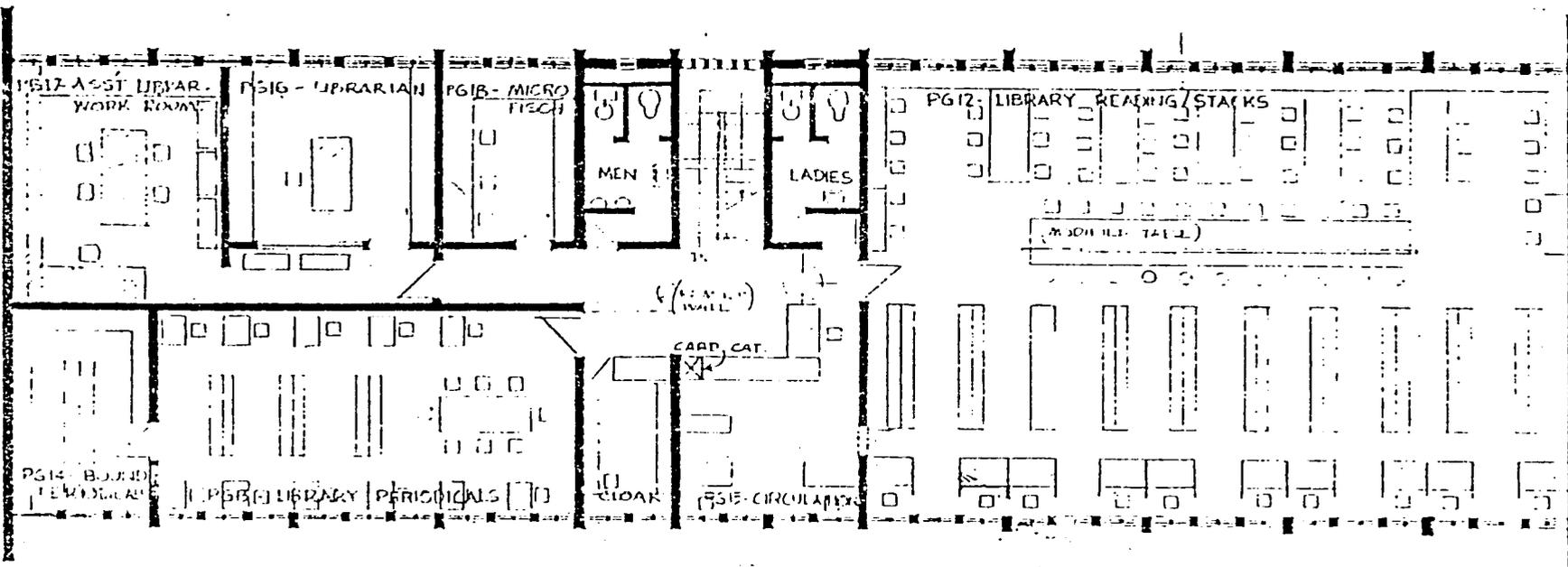
1. Selection of assistant librarian for PGIA; to be in position by 1 April 1980.
2. Provision of library consultant; April 1980.
3. Modification of PGIA building to accommodate combined library; mid-1980.
4. Merging of PGIA and FA libraries; mid-1980.
5. Procurement of library equipment and acquisitions; to start in April 1980.



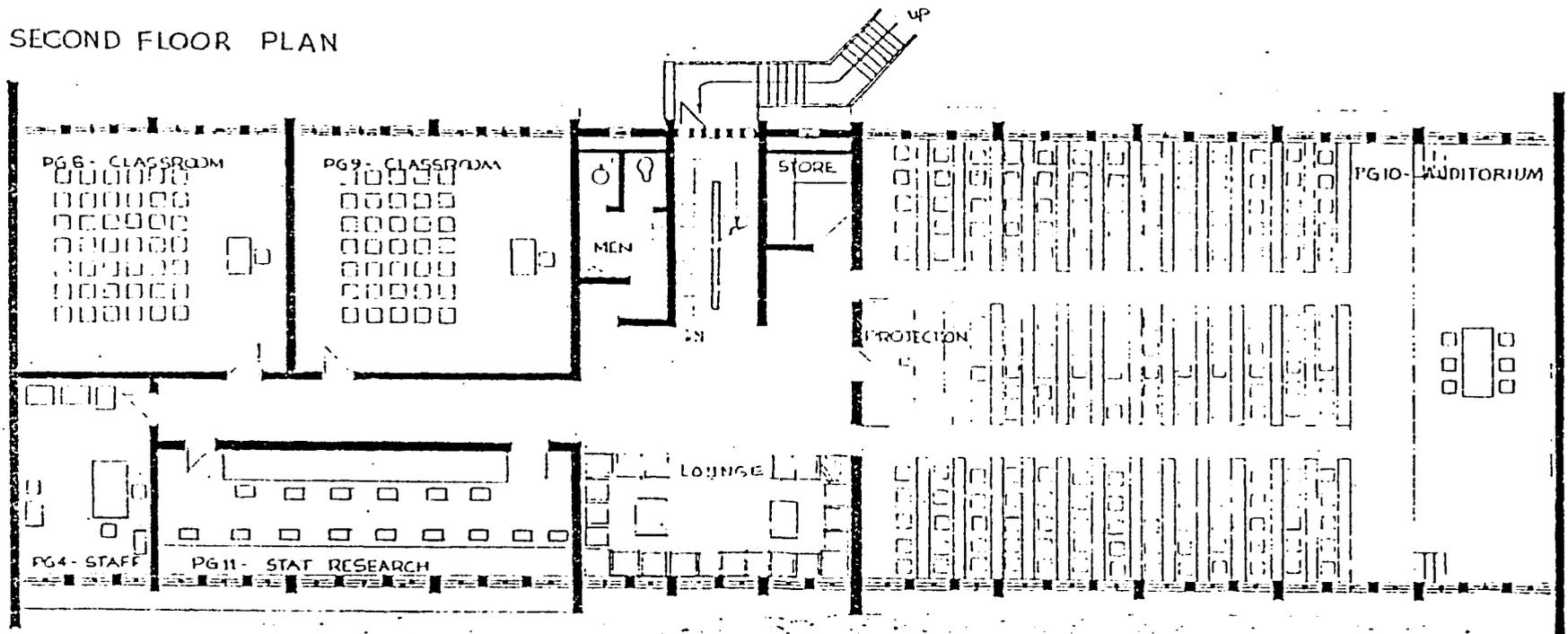
GROUND FLOOR PLAN

Figure 10. Proposed modification of PGIA building to accommodate merged undergraduate/postgraduate library.

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SECOND FLOOR PLAN



FIRST FLOOR PLAN

Figure 10. (Cont'd)

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VI. Experiment Farm Development

The GSL, through the Project Grant Agreement, is committed to contribute Rs. 5,078,000 for development of off-campus ("demonstration farm") facilities, and to provide various vehicles needed for their effective utilization. Project assistance, as anticipated in the 1979 Plan, would include a two-year technician assignment, \$60,000 in support of farm development, and ten field-type vehicles to permit staff mobility. Thus, the importance of such off-campus facilities to total PGIA/FA development has been recognized in highly concrete terms.

Off-campus facilities to be developed include the Dodangolla farm (approx. 12 miles from campus), Meewatura farm (within walking distance of the agricultural sub-campus), and the swine production unit and new animal husbandry field laboratory (on far side of University property from agricultural sub-campus). Overall planning will now also include field facilities at the Maha Illuppallama unit, although their development will be done under separate funding.

Project assistance for experiment farm development indicated in the 1979 Plan was programmed on the assumption that the above-cited Rs.5,078,000, or a substantial portion thereof, would be available for use in 1980. Unfortunately, no funds for experiment farm development were included in present-year budget estimates as finally approved. As a result, very little progress in development of off-campus facilities can be expected in 1980 (except in the animal husbandry field laboratory for which limited outside funding is available).

It is now expected that funds for development of off-campus facilities will be included and approved in the Faculty's budget estimates for 1981. Thus, the earlier projection that "various off-campus buildings and improvements" would be completed by the end of CY1981 (see Section IIA) will now require re-scheduling.

A. Phased development

Although substantive development of off-campus facilities will not be possible in 1980 as planned, some preparatory work and planning are projected that should facilitate progress when funds do become available.

Situational reports prepared for Meewatura, A.H. field laboratory, and Dodangolla, attached as Appendices B, C and D) will serve as the base for preparation of detailed plans for the phased development of these facilities as resources become available. Plans for development of farm facilities at Maha Illuppallama will be developed separately.

The Meewatura farm and parts of Dodangolla will be re-mapped to show existing contours, facilities, terraces, etc. Efforts will also be made to complete a well on Meewatura to have ready for use when further development becomes possible. Development of the A.H. field laboratory will be continued to the extent that outside resources are available for that purpose.

In short, 1980 must be categorized as a year of planning insofar as development of off-campus facilities is concerned.

B. Project assistance to farm development

Project assistance in this area is now out of phase with FA/PGIA inputs for reasons discussed above. To correct that situation, the present two-year experiment farm development assignment will be reduced to one year, ending in early September 1980. A follow-up three-month assignment is projected for 1982.

During the remainder of his current assignment, the present experiment farm development specialist will concentrate on planning activities for all off-campus facilities, including those at Maha Illuppallama. The objective will be to complete a phased master experiment farm development plan by August 1980.

C. Indicated action

1. Preparation of accurate map of Meewatura farm; completion by May 1980.
2. Completion of well on Meewatura farm; by April 1980.
3. Preparation of accurate map of relevant portions of Dodangolla farm; completion by July 1980.
4. Preparation of master plan for experiment farm development; completion by August 1980.
5. Appropriation, by GSL, of funds for development of off-campus facilities; to be available by January 1981.

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VII. Commodity Procurement

The Project Grant Agreement specifies that the GSL will provide on and off-campus facilities and furniture (see Part Two), and the AID will finance the purchase of equipment and some vehicles for the Faculty and PGIA programs. More than U.S.\$1 million (including purchase cost, shipping charges and an inflation factor) were placed in the Project budget to meet this AID commitment. According to Implementation Letter No. 1, the source and origin of grant-funded goods and services will be Code 000 (United States) of the AID geographic Code Book.

A. Vehicles

Ten jeep-type vehicles were authorized for purchase by the Project under the Project Grant Agreement. Of those, eight have been procured, and their delivery in Sri Lanka is estimated for mid-March 1980. It is anticipated that the other two vehicles will be procured during the current year.

The Project Grant Agreement also specified purchase of various types of vehicles by the GSL (buses, mini-buses, trailbikes, pickup truck and larger truck). Funds for this procurement have not yet been allocated, but will be included in PGIA/FA budget requests for 1981.

Ownership of jeeps purchased by the Project will be transferred to the PGIA as soon as feasible after they are received in Sri Lanka. Of those the PGIA will turn four back to the Project through a letter of understanding or other appropriate mechanism acceptable to all parties. The Project will have responsibility for operation, maintenance and control of the vehicles so assigned until it has been completed. These transactions will be in fulfillment of terms specified in Contract AID/ASIA-C-1397.

B. Equipment

Nearly one million dollars were specified in the 1979 Plan for purchase of equipment not including vehicles. It should be noted that this figure was derived in early 1978 from departmental requests, based on then prevailing prices. A single 10 percent inflation factor was projected. As equipment prices have, in reality, risen more than 10 percent per year since that time, and continue to rise, the amount of equipment that can be purchased with the current allocation will be sharply reduced.

To assure an equitable distribution among the departments and other divisions in the PGIA/FA, the total allocation was sub-divided as shown in Table 15. Detailed lists of equipment requests submitted by the departments in early 1978 and used in arriving at this distribution, were unfortunately misplaced before the Project was implemented. New lists of items for which there is immediate need were prepared in late 1979 by the departments in collaboration with visiting staff. Those lists are currently under review at the Consortium universities. Copies on file in the Project Field Office are available for review upon request.

Table 15. Equipment budget as projected in 1979 Plan.

Category	U.S.\$
Crop Science	109,070
Agricultural Biology	104,947
Agricultural Chemistry	88,642
Agricultural Economics/Outreach	70,700
Animal Husbandry	110,477
Agricultural Engineering	80,734
Library	9,700
Farm development	55,100
Subtotal	629,370
Inflation (10 percent)	62,937
Subtotal	692,307
Shipping (40 percent)	276,922
TOTAL	969,229

The following guidelines will be utilized in final selection of equipment to be purchased, and in determining the order of procurement:

1. An item will be approved for purchase only if adequate facilities for its use and care will be available by the time it is received.
2. An item will be approved for purchase only if needed for an existing or specially planned program of teaching, research or outreach, and if staff are in place (or will be by the time the item is received) to utilize that item.
3. Only capital items will be approved for procurement. Consumables will be purchased out of PGIA/FA funds in accordance with the terms of the Project Grant Agreement. For the purpose of this Project, consumables refer to all expendable materials, including glassware, unless such material is an integral part of a piece of equipment or unless its unit cost exceeds U.S. \$100.
4. Items will be approved for purchase only if there is assurance that consumables required for their use can be provided through local funding.
5. Time priorities for procurement will be established to minimize effects of inflation through early purchase insofar as possible, while at the same time maintaining funds in reserve to meet the requirements of programs that will be established by returning staff being trained through the AED Project and elsewhere.

Major procurement activity is scheduled to begin during the first half of CY1980 as projected in the 1979 Plan. Items selected for immediate purchase will be reviewed in detail with the Consortium Coordinator who is programmed to visit the Project in March. Upon his return to the U.S., assistance of the purchasing departments in the Consortium universities will be solicited to identify potential suppliers, develop specifications etc. Procurement will then proceed in accordance with AID regulations.

According to Additional Standard Provision Clause 5(a) of Contract No. AID/ASIA-C-1397, "... title to all equipment, materials, and supplies, the cost of which is reimbursable to Contractor by AID ... shall at all times be in the name of the Cooperating Government, or such public or private agency as the cooperating Government may designate...but all such property shall be under the custody and control of the Contractor until owner of title directs otherwise or completion of work under this contract or its termination...". The Contractor is further directed to prepare and establish a program for the "receipt, use, maintenance, protection, custody and care of equipment, materials, and supplies for which it has custodial responsibility, including the establishment of reasonable controls...".

A standard system for transferring ownership to the PGIA of materials, equipment, books, etc., procured under the Project, has been developed and will be implemented in early 1980. Inventory systems for materials, equipment, etc., remaining in the custody of the Contractor have also been developed and are presently being installed. It is anticipated that such systems will be fully developed and submitted to USAID for approval by mid-1980.

C. Indicated action

1. Procurement by Project of remaining two jeeps, with transfer of ownership, control, etc., of all the Project-procured vehicles in accordance with contract terms; completion by end of 1980.
2. Procurement, by GSL, of vehicles as specified in Project Grant Agreement; during 1981-82.
3. Procurement of equipment in accordance with guidelines and AID regulations; initiation by mid-1980, to be 80 percent completed by end of 1982.
4. Installation of inventory and control systems acceptable to USAID; completion in 1980.

VIII. Institutional and Project Planning

Assistance in overall institutional (PGIA/FA) planning was not identified as a discrete Project component in the 1979 Plan. Such assistance was implied, however, in the early priority given to facilities planning and the projected roles of visiting staff in the review, revision and/or planning of teaching, research and outreach programs. As indicated earlier in Section IB, assistance in academic planning at both department/board of study and institutional levels has now been identified as an important area in which Project assistance may well be justified.

A. Academic planning

The need for a comprehensive plan was early cited by the Project's facilities planner as a prerequisite for good facilities planning. That need has been re-emphasized by nearly all visiting staff, and received major attention during the recent Consortium Council meeting.

The Faculty of Agriculture and PGIA have taken significant steps in academic planning over the years as evidenced by the current Faculty Handbook, Five-Year Development Plan, and PGIA Regulations. Such documents should provide the baseline for future planning now needed. As presently written, however, these documents do not themselves have the scope or depth required for planned development of the Faculty and PGIA.

Academic planning activities currently underway, such as the undergraduate curriculum review and recommendation of the first and fourth year programs for undergraduates, must be accelerated and additional factors added (such as research review and planning). The need for and scope of comprehensive academic planning as discussed by Miller (Report EOT80-3) and Starling (Report EOT80-4) will provide guidelines to this effort.

B. AED Project planning

Project planning should proceed in parallel with institutional planning, and have built-in flexibility to adjust to changing needs and opportunities. It is for this reason that the annual Project reviews are so important. A major review of the Project Plan of Implementation will be made annually by the PGIA/FA and the Contractor, and recommendations for in-course corrections, modifications and/or additions will be formulated for presentation during the review sessions with representatives of USAID, the University of Peradeniya, and the Consortium universities.

C. Project assistance in planning

Virtually all technical assistance called for in the Project Paper and 1979 Plan is strongly discipline-oriented (the Chief of Party position being only a partial exception). Outside scientists and administrators will also be needed to help review present programs and also plan future development from the perspective of the institution. (Both the need and projected assistance are presented in more detail in Section IB).

D. Indicated action

1. Development of comprehensive FA/PGIA academic plan; completion of first round in 1980 and second round in 1981.
2. Annual review of Plan of Implementation in relation to progress and new opportunities or need for in-course correction.
3. Programming of appropriate Consortium university administrators (see Section IC).

IX. Other Project Components

In addition to the major inputs discussed in the preceding sections, a number of smaller inputs and contractual requirements serve to round out the AED Project.

A. Travel extensions

Objectives of the travel extension fund as described in Section II7 of the 1979 Plan are excellent. Implementation has proved difficult, however, as use of this fund is presently restricted to payment of per diem only. The example used in the 1979 Plan, namely, extension of stay at IRRRI following attendance at a meeting funded through other sources probably represents an atypical case. More frequently, at least in inquiries received to date, the request will be for some additional travel funds as well for visiting facilities and programs nearby, but not on the direct route to and from the meeting.

A contract amendment will be requested to permit payment of supplemental travel as well as per diem in cases where justified by the circumstances. In all cases, this fund will be administered in accordance with recommendations received from the GSL Project Director.

B. Project review trips to the U.S.

Annual trips of the GSL Project Director and Co-Director to review Project activities will be arranged and administered in accordance with the terms of the contract. Insofar as possible, those trips will be scheduled to coincide with the Consortium Council annual meeting during the years in which it is held in the U.S. Scheduling will be done far enough in advance of travel to assure that itineraries will be acceptable to all parties concerned.

The 1980 trip is tentatively fixed for late October or early November to coincide with the next Consortium Council meeting.

C. Reports

Quarterly, annual and final reports of activities, progress, plans and situation will be submitted in accordance with contract terms. In addition, less formal monthly reports will be distributed to interested parties as a means of keeping them informed about the Project and its progress. The distribution list for monthly reports will be expanded in response to suggestions received at the Consortium Council meeting to include appropriate Agriculture Department officers and directors of the commodity research institutes.

D. Supervision/management/logistics

A Project office (manned with local hire staff), housing and other arrangements have been established to provide administrative and logistic support to expatriate personnel under the Project. The Chief of Party serves as field program leader for all expatriate Project staff in the country. The present basic pattern is expected to continue.

E. Annual review meetings

The formal annual Project review will be conducted during the annual meeting of the Consortium Council. The present plan is to have these meetings alternate between Sri Lanka and the U.S. In years in which the Council meets in the U.S., an in-Sri Lanka review will be held prior to the Consortium Council meeting.

The tentative dates and venue for the next Consortium Council meeting are late October or early November 1980 at Pennsylvania State University. Although scheduled during the same calendar year as the recent meeting in Sri Lanka, it will be well into the next (second) Project year.

F. Project evaluation

The annual review process described above is in reality a built-in Project review system. Additional evaluation activities will be carried out as the need is recognized, or as required by USAID or the GSL.

G. Indicated action

1. Amendment of contract to permit payment of supplemental travel as part of travel extension allocations; immediate.
2. Finalize itinerary for 1980 Project review trip to U.S. to coincide with Consortium Council meeting; by July.
3. Expand distribution list for monthly progress reports; immediate.

X. Project Costs

The initial AID commitment to the AED Project as specified in the Project Grant Agreement was in the amount of three million dollars. An additional three million dollars were committed through the first amendment to that Agreement. Thus, the Project is presently funded at six million dollars, the Project Paper estimate of total life of project costs. The GSL is committed, in turn, to forty-nine million rupees as its counterpart contribution.

As discussed below, the combination of inflation and in-course adjustments will result in significant increases in total life of Project costs. The alternative would be to decrease the amount of goods and services provided, already considered minimal for achieving the objectives of the Project.

Although the present level of funding is sufficient to carry the Project through several years, a number of program decisions must be made in the near future that will depend upon the level of resources ultimately made available. Thus, responsible Project planning and management will require an early decision concerning which of the above alternatives will become the pattern to follow. Factors having cost implications for the Project are summarized in Sections A and B below. In Section C, revised estimates of LOP Project costs are compared to the budget in Contract No. AID/ASIA-C-1397. (These projections are subject to further adjustment prior to the next Project review.)

A. Impact of inflation

Continuing high rates of inflation in both the U.S. and Sri Lanka constitute the largest source of anticipated cost overruns in the AED Project. The Project Paper, upon which current funding levels are based, projected cost increases due to inflation at a rate of ten percent of the base year (1977) annually. For equipment, a single inflation factor of ten percent was used. Those projections have proved to be gross underestimations in light of the high inflation rates experienced since that time.

Inflation affects all phases of the Project, but in various ways. Where the Agreement calls for a specified quantity of input, e.g., training 38 junior staff to the PhD level, compliance will automatically increase total costs in accordance with direct influence of inflation. The same is true, of course, of all support costs linked to provision of a specified quantity of input.

If an input is specified in dollar terms, e.g., equipment, costs can be held constant through decreasing the quantity of input provided. Since such costs were originally projected on the basis of the quantity of input required to meet Project objectives, such cutbacks in quantity may well jeopardize returns realized from other Project inputs. (For example, if a trainee returns for his/her dissertation research and, later, as a fulltime staff member, but does not have equipment necessary to fulfil his assigned function, the return on the investment made in that training will be reduced accordingly.)

In either of the types of situation cited above, additional resources will be required if the Project is to provide assistance to the extent envisioned in the Project Paper.

B. Implications of Plan revisions

Refinements and adjustments projected in this revised Plan are the result of additional information and understanding gained since April 1979. They fall into three broad categories: decrease in level of effort; increase in level of effort; or, rescheduling of inputs. Nearly all have some type of cost implication; the net result is to increase projected costs.

Revisions from the 1979 Plan that have identifiable cost implications are summarized briefly below:

- a. Need for assistance in academic planning (Sections IB, VIII).
- b. Need to have several shorter assignments for facilities planner, and small increase in level of effort (Section IIA).
- c. Some other donor scholarships may not be forthcoming, leaving gap of approximately two (Section III Intro.).
- d. Clarification of time required to complete degree work permits more precise costing of training component of Project (Section IIIA).
- e. Supervision of dissertation research will require additional travel (Section IIIB).
- f. Times of departure for training rescheduled and distributed over three years instead of two (Section IIIC, Table 12).
- g. Changes in level of technical assistance result in small net increase (Section IVA, Table 14).
- h. Technical assistance assignments rescheduled with more uniform distribution and increase in total number of assignments (Section IVB, Figure 9, Table 14).
- i. Need for librarian assistance specifically identified (V Intro.).
- j. Scheduling of library acquisitions to be accelerated during early years of Project (Section VB).
- k. Assistance in experiment farm development decreased due to delays in GSL action (Section VIB).
- l. GSL to assume responsibility for purchase of portion of vehicles (Section VIIA).
- m. Need to add supplemental travel to travel extension component (Section IXA).
- n. Annual Project review trips to U.S. to include Project Director and Co-Director (Section IXB).
- o. Some adjustments in field office and home office operations have cost implications (Section IXD).

1. Decrease in level of effort. The only net decrease in level of effort is in the quantity of vehicles to be purchased. The 1979 Plan included purchase of all vehicles needed for the PGIA and FA whereas the Project Grant Agreement specifies that all except 10 field-type vehicles (jeeps) will be provided by the GSL. The amount allocated for those to be provided by the GSL has consequently been deleted from this revised Plan.

Decreases in other areas, such as technical assistance, are offset by increases within the same Project component so are not included in this category.

2. Increase in level of effort. The 1979 Plan projects the PhD training of 38 junior staff. Due to the decreasing availability of scholarships, it may be necessary to increase that number by two to provide adequate and balanced staff strength in the Agricultural Biology Department. If so, those junior staff would depart for training in September 1981.

Several changes in technical assistance assignments are now projected, with some assignments decreased and others increased. The net change, however, is an increase of 15 p/mos from 269 to 284, and an increase in the total number of assignments from 49 to 69.

The supervision of dissertation research could not be projected realistically until the training and technical assistance components had been clarified. The projections in this revised Plan indicate that approximately 20 round trips between the U.S. and Sri Lanka will be required for this purpose. It is estimated that they will be divided about equally between U.S. professors coming to Sri Lanka and PGIA/FA staff going to the U.S. The average length of visit is estimated at two weeks.

Permission to include the cost of supplemental travel as well as the presently authorized per diem to travel extensions granted to PGIA/FA staff will be requested to make this component viable.

The original Plan projected annual review trips to the U.S. by the Project Director. At that time, however, the Project was to be directed primarily to the PGIA. As presently constituted, it speaks to both the PGIA and FA; the PGIA Director and Agriculture Dean are designated as Project Director and Co-Director, respectively. It is therefore projected that both will make the annual review trips. The number of authorized trips must be increased accordingly.

Due to the rescheduling of Project inputs as discussed below, the fulltime Consortium Coordinator position will be extended through the first three years of the Project with corresponding increases in support costs.

3. Rescheduling of inputs. Rescheduling of times of departure for training, and clarification concerning time required for participants to complete their PhD work, have permitted more precise costing of the training component. Although there are some compensating changes in cost, the net will be a modest increase, largely due to inflationary effects of extending departures into 1981.

The rescheduling of technical assistance assignments to synchronize more closely with the return of participants for dissertation research will result in a noticeable shift of p/mos to later years of the Project. A significant increase in total cost will result from this shift due to the impact of inflation. This increase will be quite apart from increases resulting from the increased level of effort cited above.

The planned acceleration in procurement of library acquisitions will help to minimize effects of inflation, but will not in itself affect total cost (see Section A above).

Adjustments in field office operations will be largely compensating insofar as they can be projected at this time. Some early savings on housing costs are expected to be offset later by longer-than-projected tenure per house, and rising rent and utilities costs. Early savings in projected local staff salaries and benefits will be offset by salary increases during the life of the Project, and needed increases in level of effort.

C. Revised LOP budget projections

Life of Project costs have been re-assessed, taking into consideration the implications of both Plan revisions and higher than expected rates of inflation. Based upon assumptions utilized in projecting future inflation, it appears that an increase of as much as 38 percent in overall funding level may be required to carry out the Project in accordance with this Plan of Implementation.

It is difficult to distinguish clearly between cost increases due to inflation and those resulting from revisions in the Plan, because of the confounding effect of redistributing Project inputs (particularly technical assistance). Worthy of note in this regard, however, projected increases in costs for equipment and library acquisitions are about 42 and 70 percent, respectively. These increases are due entirely to inflation.

D. Indicated action

1. Inform USAID of budget situation, including reasons for projected cost increases, and request needed increase in authorized LOP level of funding.
2. Accelerate procurement of equipment, library acquisitions, and remaining vehicles to the maximum extent feasible, to minimize effects of rising prices.
3. Manage the utilization of Project resources judiciously, seeking to take advantage of every available opportunity to hold down costs without jeopardizing Project performance.
4. Review GSL counterpart contribution estimates periodically to assure that anticipated Project inputs are in phase with them.
5. Review LOP cost estimates at least annually, making adjustments as needed, and keep USAID and GSL informed of anticipated changes.

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XI. Potential New Project Components

The combination of inflation and recently identified needs will render it exceedingly difficult to meet all commitments of the Project as presently constituted unless some supplemental funding is authorized. Fulfilling those commitments obviously must take top priority. Nevertheless, there are opportunities for significantly increasing Project impact on higher education in agriculture in Sri Lanka at modest additional cost. Such opportunities merit consideration for separate or supplemental funding in the future.

A. Professional improvement of senior PGIA/FA staff

The present Project provides funds for a large number of visiting professors to come to Sri Lanka and for some 58 junior staff to travel to the U.S. for postgraduate training. No provision is made, however, for senior PGIA/Faculty staff to travel to the U.S. for professional interaction and improvement. Institutional development is a two-way street. In some instances, as much may be accomplished through a visit to a U.S. university by a senior staff member from the PGIA/Faculty as from a visit to Sri Lanka by a faculty member from that U.S. university. Also, senior staff and administrators must keep up to date in their fields if they hope to provide leadership and guidance to the young staff who will soon be returning to Peradeniya with PhD's.

The need will be met partially through travel associated with supervision of participant research as set forth in Section IIIB. Possibilities for visiting or exchange professorships for PGIA/FA staff combined with sabbatical leave (for which foreign travel is at least partially paid) will also be explored. Other potential sources of support for visits to U.S. universities will be explored by Consortium members and the PGIA/Faculty during the current year. In the event that need still exists, a modest augmentation of Project funding will be requested beginning in 1981 to permit one or two faculty trips per year to the U.S. for professional consultation and improvement.

B. Technical training

In addition to the core staff PhD training provided under the present AED Project, non-academic technician training will also be required to provide qualified support staff to man the newly equipped laboratories, field plots, etc. Laboratory technicians, field assistants, equipment maintenance and repair staff, mechanics, statistical assistants and machine operators will be among the types of support staff needed. As the institution expands in both size and programs, selected administrative staff will also need additional training in order to manage the increased workload.

Training for positions such as those described above will usually be short term, intensive, practical, and highly job-specific. In some instances, on-the-job type training is most desirable.

A survey of such training needs, and existing training opportunities will be made during the current year. If that survey reveals needs that cannot be met through other sources, a proposal for supplemental funding for this purpose will then be submitted for consideration by USAID and other donor agencies.

C. Assistance in biometrics

No AED inputs in the area of biometrics have been projected to date as the British ODA is providing a CEC lecturer in biometrics to the PGIA, and a Faculty of Agriculture member is currently finishing a masters program in statistics at Los Banos. It was assumed that such assistance would meet at least immediate and near future needs.

Discussion during the Consortium Council meeting at Peradeniya would indicate that the biometrics situation should be re-examined to determine whether or not additional inputs may still be needed. This will be done during the present year in collaboration with the British Council.

D. Assistance to new agricultural faculties

The new Ruhuna University College at Matara is developing an agricultural faculty under the guidance of the Peradeniya Faculty. Although requests have been received for assistance to the new faculty, such are outside the scope of the present AED Project. Nevertheless, the development of Ruhuna and other new agricultural faculties projected for Jaffna and Batticaloa will unquestionably affect progress and results in the AED Project. There will be competition for scarce financial resources and even scarcer trained staff. All will be contributing toward meeting Sri Lanka's need for agriculturally trained manpower. Future postgraduate students in the PGIA will include graduates from the new faculties as well as from Peradeniya.

Substantive program and training assistance to such new faculties of agriculture conceivably could be provided at modest additional cost through an amendment to the AED Project. This situation will be examined in greater depth during the current year. If justified, preliminary recommendations will be developed concerning the nature and extent of assistance that might be appropriate, including suggested linkages with the present Project. Such recommendations will be presented to the Consortium Council for deliberation and, if approved, later submitted to USAID for their consideration.

E. Assistance in animal protection

The present AED Project is unbalanced in the sense that it encompasses both crop and animal production but only crop protection. Animal protection is under the purview of Veterinary Science which is not now included in the Project. The Department of Animal Husbandry teaches all animal production courses for Veterinary Science and is scheduled soon to become a joint department with appointments in both Agriculture and Veterinary Science. Since a major objective in the Project is to consider all enterprises of the farmer within the context of a total farm enterprise, including livestock, consideration of adding and funding an animal protection component would appear to merit consideration. As there is possibility that assistance to the Veterinary Science Faculty may be forthcoming from another donor agency, however, this question will be held in abeyance for the present.

F. Indicated action

1. Formation of a small committee, including representation from the PGIA, Faculty of Agriculture and Contractor, to provide leadership to the studies projected above; immediate.
2. Determination of need for and recommendations relative to possible support for professional improvement trips; completion by October 1980.
3. Development of recommendations relative to technician training; completion by October 1980.
4. Examination of situation with respect to biometrics; completion by October 1980.
5. Study of development of new faculties of agriculture as they may affect the AED Project, and investigation of potential need for support that might be provided through an amended AED Project; completion by October 1980.

APPENDICES

- A. PARTICIPANTS IN CAED CONSORTIUM
COUNCIL MEETING, PERADENIYA
FEBRAURY 7-8, 1980

- B. MEEWATURA FARM DEVELOPMENT
REPORT
DECEMBER 15, 1979

- C. DEVELOPMENT REPORT FOR LIVE-
STOCK FIELD LABORATORY
JANUARY 7, 1980

- D. DODANGOLLA RESEARCH FARM
DEVELOPMENT RECORD
JANUARY 16, 1980

APPENDIX A

Participants in CAED Consortium Council Meeting, Peradeniya
February 7-8, 1980

Opening sessions only:

Dr. Stanley Kalpage	Secretary to Ministry of Higher Education, and Chairman, University Grants Commission.
Dr. B.L.Panditharatne	Vice Chancellor, University of Peradeniya.
Miss S.J.Littlefield	Mission Director, USAID/Sri Lanka
Mr. R.S.Rajapakse	Assistant Registrar, PGIA

All sessions:

Dr. T.Jogarathnan	Director, PGIA
Dr. Y.D.A.Senanayake	Dean, Faculty of Agriculture
Dr. H.P.M.Gunasena	Head, Dept. of Crop Science
Dr. M.W.Thenabadu	Head, Dept. of Agric. Chemistry
Dr. H.M.W.Herath	Head, Dept. of Agric. Biology
Dr. S.Pinnaduware	Head, Dept. of Agric. Econ./Extension
Prof. S.B.Rajaguru	Head, Dept. of Animal Husbandry
Dr. A.Kandiah	Head, Dept. of Agric. Engineering
Dr. J.M.Beattie	Dean of Agriculture, Pennsylvania State University
Dr. R.H.McAlexander	Coordinator International Programs, Pennsylvania State University
Dr. H.O.Kunkel	Dean of Agriculture, Texas A&M University
Dr. M.E.Bloodworth	Director, International Programs, Texas A&M University
Dr. J.H.Nichols	Dean of Agric. & Life Sciences, VPI & State University
Dr. P.H.Massey	Assoc. Dean of Agric. & Life Sciences, VPI & State University
Dr. A.C.Eurich	President, Academy for Educational Development
Mr. S.F.Moseley	Actg Consortium Coordinator, Academy for Educational Development
Dr. Howard E. Ray	CAED Chief of Party
Dr. P.von Blanckenburg	Visiting Lecturer, Tech.University of Berlin
Dr. Howard Ross-Parker	Visiting Lecturer in Biometrics, Overseas Development Mission, U.K.
Dr. James Deegan	Visiting Specialist, Rural Sociology, CAED
Dr. A.E.Erickson	Visiting Specialist, Soil Physics, CAED
Dr. Elwood Hatley	Visiting Specialist, Cropping Systems, CAED
Mr. Wm. G. Downs	Experiment Farm Development Specialist, CAED
Dr. James Starling	Head, Dept. of Agron., Penn State

Final session and business
meeting:

Mr. T.Wilson	ADO, USAID/SL
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15 December 1979

MEEWATURA FARM DEVELOPMENT REPORT

I. INTRODUCTION

1. Location and Size
2. Physical Features
3. Soils
4. History
5. Current Use

II. A. Future Use - General

B. Future Use - By Department

1. Agricultural Engineering

- (a) Water Management
- (b) Lysimeter
- (c) Tillage
- (d) Land Forming
- (e) Soil and Water Conservation
- (f) Surveying Techniques

2. Crop Science

- (a) Cropping Systems - Annuals
- (b) Variety Evaluation
- (c) Seeding and Planting Techniques
- (d) Fertilizer
- (e) Composting
- (f) Minor Forestry
- (g) Climatology

3. Agricultural Biology

- (a) Entomology
- (b) Plant Pathology
- (c) Plant Physiology
- (d) Growth Regulation
- (e) Germ Plasm Evaluation

4. Agricultural Chemistry & Physics

- (a) Soil Characterization
- (b) Soil Structure and Texture
- (c) Sampling Techniques
- (d) Soil Physics
- (e) Soil Fertility

III. LAND DIVISION FOR USE

IV. PREPARATION FOR USE -

STAGE I - Time Table

1. Elimination of "Squatters"
2. Fencing
3. Entrance Road Construction
4. Well Construction
5. Electrical Entrance
6. Appointment of Assistant Manager

STAGE 2

1. Pump
2. Development of Field Roads
3. Undercover Meeting Area
4. Workshop or Storage Building
5. Plant House
6. Tank and Piping
7. Irrigation Channel
8. Weather Station

V. CONCLUSIONS

Enclosures:

- Farm Map
- Building Layout Plans

I.

INTRODUCTION

1. Location and Size

Meewatura Farm lies just south of the major portion of the University of Peradeniya campus along the Mahaweli River. It is accessible by a foot bridge that crosses the river and also by vehicle from the Gampola Road. It is the only piece of designated agricultural land available to the faculty of agriculture within easy walking distance from the buildings.

There are 24 acres available for various usage depending on slope and soil characteristics. The small size would discourage its use for large animal or grazing studies.

2. The entrance to the farm from the Gampola Road is down a relatively steep embankment which extends along the entire road edge. At present this embankment is covered with grasses and weeds and has limited possibilities for development. The northern side is bordered by the steep cause way fill that leads to the foot bridge. At the base of this slope there is a planting of plantain and cassava. As the land area tapers off towards the river there is a steep river bank covered with brush and only useful as a buffer zone. The southern edge is a relatively level slope extending below the University water supply and treatment plant. There have been plantings of teak started in this area and although it looks brushy at present there are possibilities for additional plantings.

The central portion of the farm is cleared, is being cultivated and has moderate slopes ranging from 1 to 7 per cent. As the land tapers down from the road there is a partial bench on fairly high ground.

Major portions of the land lie within the floodplain of the Mahaweli. Although the flooding does not occur on an annual basis, it may occur often enough to preclude full usage of all acres for permanent installation or long term field experiments.

3. The bulk of the soils are silt and sand of an alluvial character with some fairly shallow eroded areas on the steeper slopes toward the road. Generally the soils are well drained and lack much definition of horizons. They are quite workable and with adequate additions of plant food are productive.

4. Meewatura has been available for use by the faculty of agriculture for about 16 years. In the early years there were plantings of a more permanent nature with interplantings of annual crops. From time to time flooding occurred and many of the plantings were abandoned. At one point the crops were cleared off and some buildings were erected. The buildings have not been entirely satisfactory and are inaccessible in periods of high water.

Several of the central areas were at one time in paddy and are informally terraced. There was a period when a valuable and highly usable irrigation system with pump, pipe, and sprinklers was in operation. The highly variable level of the Mahaweli made it difficult to draw water from that source. The irrigation equipment has been neglected and with difficulty may be recoverable. A large dug well at a usable site had been started but was abandoned because of inadequate safety measures for hand digging and lack of financial support.

At another period when there was a food shortage in Sri Lanka several acres were loaned for use by neighbours and University employees. Over the past several years these "squatters" have become entrenched and impair the total usefulness and control of the farm.

The general picture at this point is one of informal partial use on a "catch as catch can" basis. There is a lack of overall control and because of flooding possibilities only short term projects are being initiated.

II. A. FUTURE USE - GENERAL

All departments involved have indicated a willingness to use the farm for short term projects. Each senior class of students must have a project paper devoted to some aspect of a speciality within that student's chosen field. Because of the proximity of the farm it should fit the needs of many students for their senior project. Since most of these projects are short term and must be completed within one year the limitations imposed on the farm by flooding possibilities are not serious.

Again because of proximity all departments can use the facilities for teaching and demonstration in informal and highly practical ways if only the most rudimentary facilities are provided.

B. FUTURE USE - BY DEPARTMENT

1. Agricultural Engineering -

- (a) Water management is basic to the agriculture of Sri Lanka. Water may be brought to the field by large ditches, sluices and gates from tanks but if the water is then over or under used because of poor management at the field level, much of the effectiveness of irrigation is wasted. Meewatura is a good place to teach and demonstrate on a limited basis what may be used later on a large scale on the farm.
- (b) Lysimeter studies may be included under agricultural engineering partly because a structure is needed. These studies also demonstrate the movement of water downward through the soil. Here is also an opportunity for cooperative studies with soil chemistry to indicate the movement of fertilizer elements with the water.

- (c) Tillage studies will become more important to the agriculture of Sri Lanka as more acres are opened up in the Mahaweli Project and more mechanical equipment comes into use. This is not to deprecate the use of hand or buffalo power which may also be studied at the same site.
- (d) Land forming and terracing may be considered as an adjunct to irrigation and tillage since they are elements that cannot be completely separated from each other. The farm lends itself to certain features of land forming and may be considered a good place to teach and demonstrate techniques on a small scale.
- (e) Soil and water conservation is often stated as a separate study but in reality these elements like irrigation, land forming and tillage are all part of the total study of getting the farm producing and keeping it producing. There are possibilities at Meewatura for structures that demonstrate principles which may be used on a much wider scale in future farming.
- (f) Surveying is a basic study within agricultural engineering. Most of the previously mentioned study areas will use surveying as a technique. Here is an excellent place to teach and demonstrate land measurement, contouring and terracing and many of the most basic phases of this highly important discipline.

2. Crop Science

- (a) Cropping systems can be described as the study of mixed cropping to use the potential of each land division to the fullest for continued production. Meewatura can be used for short range cropping system studies with particular emphasis on annual crops.
- (b) Variety evaluation studies can usually be carried out on an annual basis particularly with vegetables. This is one of the types of studies that might fit into a senior project.
- (c) Seeding and planting techniques may be used for teaching and demonstration as various types of equipment become available. At every stage training of the agricultural student should be the key to the development of Meewatura.
- (d) Fertilizer use and crop response may be included under both crop science and soil science because there are phases that fit in both categories. Many fertilizer studies may be carried out on an annual basis and again fit the senior project criterion.
- (e) Composting studies may not only serve the teaching and demonstrational needs of some phase of crop science but could also be a cooperative project with soil science and agricultural biology. It is an excellent demonstration of uses for crop residue and brush.

- (f) Where perennial trees already exist and can be retained or where new planting can be accomplished minor forestry projects can be used for teaching and demonstration. The same piece of woodland might be used for numerous growth studies over a period of years and the growth of companion plantings could be monitored.
- (g) Climatological studies may be considered a system of benchworks that can be used by all departments in their particular fields. A part of the equipment is already on site and can be expanded to make a meaningful contribution to all agricultural studies.

3. Agricultural Biology

- (a) Entomology as a study occurs where plants are that are affected and where a student can reach those plants. Meewatura can be much more useful than it has been in the past for students in this field.
- (b) Plant pathology can also be grouped in this type of study. Special plantings may be made of resistant strains or existing plants may be screened for resistance. Control studies can be carried out either in special projects or cooperatively with other projects. It is an excellent location for identification classes again because of proximity.
- (c) Although many aspects of plant physiology may be studied in the field on crops planted for other purposes, there is a need for a plant house where at least control over most types of predators may be practiced.
- (d) Growth regulators and chemical weed control activity within the plant must often be studied under certain measures of control. A plant house which is partially shaded could give this control. A green house does not appear to be necessary or feasible at this time at this location but a screened and covered enclosure with easy access to water would fit the present needs.
- (e) Germ plasm evaluation is a broad term that could cover certain aspects of genetics, plant breeding and varietal development. Field evaluation is usually on a small scale in the beginning phases and could be carried out at this site.

4. Agricultural Chemistry and Physics

- (a) Soil characterization studies are expected to be carried out on a limited basis at Meewatura mainly because the types of soils at this location are limited. In general these studies do not need a special plot of ground because the field study occurs in small areas at selected locations.

- (b) Soil texture and structure studies may go hand in hand with characterization and only differ in their application for agricultural soils use and understanding.
- (c) Sampling techniques must be taught at the basic level and instruction can occur easily as part of other studies in this general field. Again proximity or accessibility puts Meewatura in a favourable light.
- (d) Some phases of soil physics may also become a part of these studies and may be entered into cooperatively with Agricultural Engineering particularly as soils are affected by tillage practices.
- (e) Soil Fertility principles must be taught in the field at early stages, again Meewatura is available and nearby. Here is another chance for cooperative study with crop science and Ag. Engineering. Crop response to fertilizer is often related to placement as much as it may be to either ratio or total quantity applied. Placement may be a problem in equipment design or usage.

III. LAND DIVISION FOR USE

Several of the anticipated changes that must occur to give the control and accessibility needed by all departments are being directed by Agricultural Engineering. This is not to imply that the farm will continue to be managed this way in the future. It is anticipated that land assignment will be by committee action taken at least annually. An effort should be made to have as many cooperative projects as possible to conserve space and reduce management requirements. There are several permanent installations such as the weather station, plant house, meeting area and demonstrational irrigation channel with associated tank which will be available to all departments as needed. Some type of scheduling will be necessary but may occur through one office designated by the committee. No effort will be made to permanently assign portions of the farm to a certain department unless some installation is needed that would make change difficult.

IV. PREPARATION FOR USE -

STAGE 1

1. Preliminary contacts have been made through the Dean of the FA and the Registrar of the University to eliminate the "squatters" from Meewatura. It will probably take some period before the complete control of all acres is regained, but legally the individuals will have no cause to continue to cultivate and harvest crops.

2. 2,500 feet of 5 strand barbed wire fence on concrete posts set at 10 foot intervals is proposed as soon as funds become available. A tanded or locked gate at the entrance on Campola Road will limit entry to only one location. The fence can be set close to the river at both ends of the farm but will not be necessary along the river edge.

Preliminary estimate of the cost of this fence installed is Rs. 50,000 after consultation with the University Maintenance Engineer.

3. The present entry road is steep and unstable. A redesigned, regraded and surfaced entry road 10 feet wide and 500 feet long is proposed. This road will reach to a point where the hill levels out enough to permit a turnaround and parking area which at this time will only need to be graded. The proposed building sites will be adjacent to the south of the turning area at about the same relative level. Preliminary estimates for the entry road are Rs. 50,000.

4. A walled dug well 10 feet in diameter by 25 feet in depth is proposed at the site of the previously started well. The depth allows water to be extracted at roughly the level of the Mahaweli below normal flow. Estimates of production or recharge of this well appear to be adequate for the type of use envisioned. Estimates of cost are Rs.20,000 including the wall above soil level to 3 feet.

5. In order to operate an electrical pump at the well a three phase entry will be necessary to the well site. The estimated cost of this 800 feet of poles and wire is Rs. 25,000. Other entries to the future buildings may be taken off of this line as single phase when necessary.

6. As this Stage 1 changes are being affected it will be necessary to appoint someone to oversee the day-to-day activities and to begin to tighten security at the site. It is proposed that this person be either a technician within a department or new appointee with limited managerial capabilities.

There is presently a resident watcher-laborer grade who lives in a hut in a flood prone area. This man should be retained but his quarters should be moved to a high area to the south of the proposed buildings. At the same time water lines from the University Treatment Plant can be taken by his quarters to the proposed buildings. This water would be for human consumption only.

The timetable for Stage 1 changes should be completed by April 1980. Road and well construction are somewhat dependent on a maximum of rain free days. In order to start any of the above mentioned projects there will be a necessity for special grants to proceed on any type of schedule.

The following are the estimates by item and total for Stage 1 :

1. Fence

2500 feet-posts and barbed wire installed Rs. 50,000

2. Road

Grading and surfacing - 10' x 500' - metalled Rs. 50,000

Rs. 100,000 c/f

b/f Rs.100,000

- | | | |
|----|--|--------------------|
| 3. | <u>Well</u> | |
| | Dug and walled - 10' diameter x 25' deep | Rs. 20,000 |
| 4. | <u>3 Phase Entry</u> | |
| | Poles and Wire - 800' installed | Rs. 25,000 |
| | | <u>Rs. 145,000</u> |

Stage 2 of the development of Meewatura cannot be given a definite timetable, but certain portions may overlap with Stage 1 or have to wait as appropriations become available out of the 1981 University budget. Though the following items are loosely on a priority basis some are more attainable and may be constructed or purchased at any time.

1. A 10 horsepower electric pump to be placed at the well will feed both a tank on the high part of the south end of the farm and a sprinkler irrigation system for the central section.
2. The development of a field road system should start at any time that manpower and equipment is available. Starting at the end of the surfaced entry road a straight section is planned in an easterly direction to the vicinity of the present buildings. This section will be about 500 feet long with a spur of about 150 feet going to the well site. At the end of the 500 feet section a cross road will be constructed going north 300 feet and south 900 feet. Total length of field road will be 1850 feet but should be relatively inexpensive since only a few portions will have to have heavy rock added. Most of the road will be graded and packed by roller and is not expected to be suitable for anything but tractors or four wheel drive vehicles.
3. The building area is planned extending southward from the turnaround at about the 105 foot elevation level. No flooding has occurred at this level in the memory of anyone questioned.

Although the final design of buildings is still pending the plan is to start with an open but undercover meeting area that will comfortably admit 50 or more persons. This can be a pole type structure attached to a more permanent building to the south. Dimensions will be roughly 30' x 40' and height will be adequate to admit rolling equipment.

At the present a packed earth floor surface is planned which may be surfaced if cement becomes more plentiful at a later date. If adequate drainage is provided on the upper side, this type of floor should be satisfactory for field class meetings.

4. Extending southward from the meeting area and contiguous to the pole building a more secure and usable building is planned which will house the office, storage, machinery and field laboratories necessary for all departments. Overall dimensions may be changed in the final plan but 40 feet by 60 feet is a reasonable possibility.

The 40 foot northern end will open on to the class meeting area with a wide equipment door and a conventional personnel door.

Except for a consumable store room in one corner all sides may be open above a 3 foot level but will be heavily meshed to provide security. With wide eaves and a surfaced floor this building should provide good ventilation and be serviceable in all weather.

5. To the south of these buildings, but not attached, a plant house with low walls and heavy meshed sides is planned. 20 feet by 30 feet would seem to be adequate at this time but additional houses could be added if the needs and resources changed in the future.
6. To service the plant house, provide water for irrigation. channel studies and possibly water for trickle irrigation studies a tank of roughly 10,000 gallon capacity is planned to be constructed at ground level but at a high point on the western side of the farm near the Campola Road. Piping from the well to the tank will have to be buried eventually but could be laid on top of the ground temporarily.
7. Below the buildings but above the 1100 foot elevation level a surfaced irrigation channel of 700 feet of length is planned. This may be constructed with variable cross section characteristics and will be to demonstrate and teach flow mechanics. Water may be directed off this channel to irrigate small sections of fields to the low side as a management technique. Unlined laterals will be directed downslope from the lined channel and may be changed to suit the cropping pattern.
8. The present weather station is at the 1090 foot elevation and is too near the possible flood area to be unquestionably operable. There are additional pieces of equipment that will make a more significant contribution to climatological studies that should be added.

For these reasons it is planned to move the station near the new building level and to add the necessary new equipment. There is an area to the south and below the buildings at the 1103 foot elevation level which appears to be suitable and would not be influenced by the buildings.

V. CONCLUSIONS

Starting from these proposals but not limiting development of Meewatura absolutely to these proposals it is felt that the farm can develop along lines that will mean controlled usefulness to several departments. Much of the planning that went into this report came from informal contacts with Dr. Kandiah, Dr. Gunasena, Dr. Herath, Dr. Thenabadu, Dean Senanayake and Dr. Howard Ray as well as other members of these departments. It is only a step from planning to execution but often a large step that will need much additional effort.

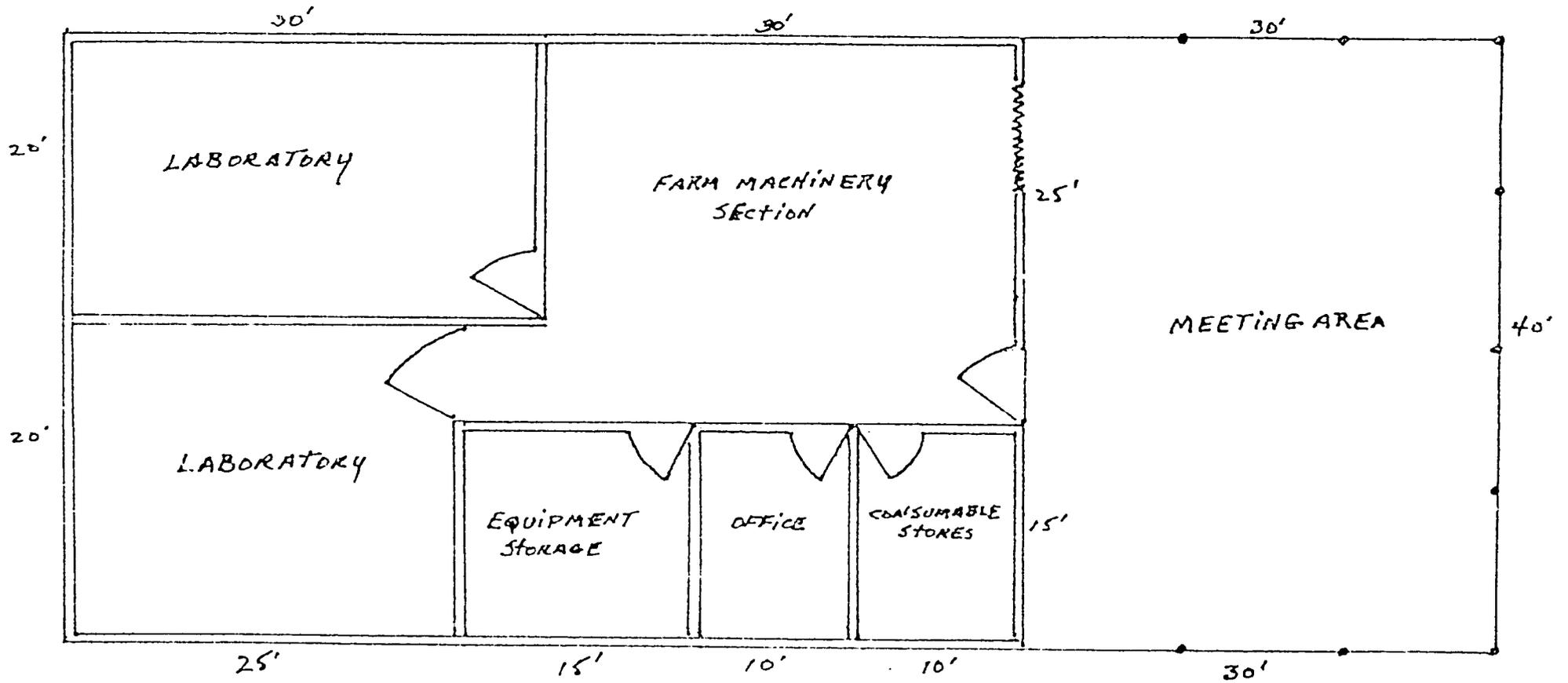
If a formal committee is needed to activate and accelerate the execution of the plan it is suggested that this committee be appointed soon. If Stage 1 can be accomplished on schedule the farm can be operated more satisfactorily in the coming year.

Submitted by,



Wm. G. Downs

Experimental Farms Development Specialist
AED PROJECT



FIELD STATION LABORATORY AND MEETING AREA - MEEWATURA FARM - FLOOR PLAN - 90' X 40'

DEVELOPMENT REPORT FOR THE LIVESTOCK FIELD LABORATORY
ANIMAL HUSBANDRY DEPARTMENT - UNIVERSITY OF PERADENIYA

I. INTRODUCTION

1. History
2. Size-Location
3. Soils
4. Physical Features
5. Current Use

II. PROGRAM OBJECTIVES -

- a. Applied Aspects
- b. Field Orientation
- c. Teaching and Research
- d. Improved Genetic Material
- e. Training Opportunities
- f. Self-sufficiency
- g. Support
- h. Comments

III. POTENTIAL USE

1. Availability
2. Similarity to other abandoned estates
3. Manual operation
4. Road construction
5. Feeding trials
6. Agrostology studies - Fertility
7. Classes and breeds as a teaching tool
8. Genetics and breeding programs
9. Dairy production
10. Alternate energy production

IV. RESEARCH ORIENTATION

V. DEVELOPMENT DIRECTION

1. General area
2. Roads
3. Buildings and Pastures
 - a. Goats
 - b. Dairy, silo, bio-gas
 - c. Rabbits
 - d. Ducks
 - e. Fish
 - f. Poultry
 - g. Teaching Centers
 - h. Cattle breeding

VI. CONSTRAINTS

1. Slopes
2. Roads
3. Security
4. Hand operations
5. Acidity and Fertility
6. Weeds
7. Electrical Entry
8. Teaching and Laboratory

I. INTRODUCTION

1. The animal husbandry department was given the use of land to develop a livestock field laboratory in March 1979. The purpose was to have facilities near the campus for teaching, research and extension programs. Land was available on an abandoned tea estate within two miles of the main campus.

2. Although there is a large acreage available for future development only 40 acres are involved at present. Expansion will depend on availability of funds and on the success of the present venture. The land lies to the east of the campus in the HANTANA HILLS.

3. Like many of the abandoned tea estates it lies on the upper hills and is extremely steep. The soils were badly eroded even at the time it was in tea and years of natural cover have not helped to rebuild the soil. The soils are gravelly to sandy with a number of large rocks scattered on the surface. The soils are acid and low in natural fertility.

4. There are several definite ridges with small valleys leading down from spring fed streams. Near the base these small valleys level out enough to be developed into very narrow and steeply sloping paddy areas. These were abandoned recently and form a hub area for some types of development.

5. At the time that the Animal Husbandry Department took over the farm, a few small areas were being used for pasture or green cutting by villagers who lived nearby. A small area had several buildings on it and one of these was converted to a temporary office. The others have been torn down or are being rebuilt for new uses.

II. In the words of the Department of Animal Husbandry for their original programme proposal the objectives of this programme are:

- (a) To provide opportunities for the students of Agriculture and Veterinary Science to be involved in livestock extension with the intention of introducing the students to the applied aspects of livestock production and extension.
- (b) To reorganize and strengthen the Livestock Education Programme of the Department with greater emphasis on the field-oriented aspects of livestock production.
- (c) To provide opportunities to the teaching staff of the Department of Animal Husbandry to introduce a problem oriented teaching and research programme in the Department.
- (d) To provide opportunities to the needy livestock producers in the area around the University to receive new knowledge and improved genetic material from the resources available in the Department of Animal Husbandry.

- (e) To provide training opportunities for the unemployed youth in the area in different aspects of livestock production to induce them towards self-employment in livestock production.
- (f) It is anticipated that the student participation in the envisaged training programme will equip them with better knowledge in extension and problem-oriented back-ground in livestock production, to enable them to be more effective in assisting Sri Lanka to achieve self-sufficiency in milk, meat and eggs.

It is hoped to develop this programme to a self-supporting level within two years with the income arising from the unit that will function as the field laboratory. The Freedom from Hunger Campaign of Sri Lanka has expressed their desire to finance this project by providing Rs.255,000/= received as the expenses for the first two years provided that the approval for this project could be obtained from the Ministry of Agriculture. This project will be complementary to the livestock extension effort of the Agricultural Ministry and will help to produce better trained graduates in livestock production who will be responsible for the Livestock Development Programme of the Ministry.

Comments -

Since the original programme proposal was submitted approval for the project was obtained and work has started along several lines.

The designation of the project as a Field Laboratory implies research and it is possible that observers will not completely understand the concept that a Field Laboratory need not necessarily have involved equipment such as a chemistry or physics laboratory. The animals, the buildings, the plantings and the process are all part of the laboratory. In this respect teaching, research and extension can all take place within the laboratory and will form the reason for its existence.

A very definite point was made that the programme should reach a self-supporting level within two years. Although the idea of profit is not bad it seldom is complementary to the objectives. Quite often the timing, management and labor requirements differ and may be in conflict with the stated objectives when profit becomes a major objective. Too often this incentive turns a teaching research and extension facility into just a Field Production unit. It might be wise to eliminate the profit incentive but make every attempt to lose as little money as possible in the management of the facility.

III. Potential and Uses

1. The availability of this particular piece of ground was the greatest item in its favor as compared to any other site. It is near to the campus and was not being used for any other purpose.

2. In addition it is similar to many abandoned tea estates and can serve as a demonstration of the potential of these sites.

It does not lend itself to mechanical tillage or harvesting and therefore will have to be primarily worked by hand. As herds and flocks are fed from the forage production and manure is returned to the soil, improvement in the organic matter levels should result.

4. Construction of access and field roads will be necessary for students and visitors to reach at least the building and main green chopping areas.

5. Creditable research can be carried out at the farm. As long as animals can be housed, controlled and fed it will be possible to do feeding trials. The future of ruminant nutrition in Sri Lanka dictates that forages will have to be the main diet for many years. This type of land will have to be used for this purpose since it cannot economically feed humans directly. Barn feeding, pasturing and conserved forage feeding are three approaches that can be fitted to the livestock program.

These approaches will be valuable extension tools in that observers can see at one site all three methods of feeding.

6. Although plot harvesting, planting and fertilizing will be difficult processes under these conditions there will be ample opportunity for good agrostology studies. Once the plantings are well started they will be valuable for teaching and extension as well as for research. They may be used for identification and management studies equally well.

7. Numerous classes and breeds of livestock are planned to be housed and fed at this site. Having these animals at one site will make a valuable tool in teaching and extension. Goats, dairy cattle, buffalo, beef as well as rabbits, ducks, poultry and fish are all planned for an integrated program. Swine will be nearby at the piggery which is already fairly well developed.

8. Within these classes of livestock there will be the possibility for selection programs, cross-breeding work and genetic studies that will be of value to the whole of Sri Lanka. The offspring of these animals may at some point be available for sale to other active farmers. Physiology and animal behaviour work may also be developed as part of the program.

9. Dairy production research, teaching and extension are planned as a major thrust at the Field Laboratory. Total management should include milk sanitation and quality control with the use of mechanical milkers and some type of cooling system.

10. With the production of animal manure in a confined area there exists a potential for the production of bio-gas or methane. Here is a chance for cooperative research, teaching and extension with Engineering and Ag. Engineering. This is also a chance for integrating dairy management with duck, poultry and fish management as the effluent may be used for algae and plankton production. The final use for the gas may be for cooling milk, heating water, running milking machines and various other equipment. The slurry remaining after gas production can be used as a field fertilizer.

- IV. The success of the potential uses for the Field Laboratory depend on management of high quality and attention to details. Good research, teaching and extension cannot automatically arise out of production orientation. A strong and constant determination will be necessary to keep this unit functioning for the intended purpose.

It seems almost too basic to mention that good animal feeding throughout the entire year will be necessary to make the program a success. This is one concept that appears to have been weak in the past. The unit must be a showplace for the Animal Husbandry department and the University. With this in mind it would be best to expand livestock numbers slowly until the potential production of these eroded acres is well known.

- V. 1. Development of the Field Laboratory has been well started under the direction and planning of Prof. Rajaguru. The natural hub of the building program has been dependent on enough land that could be levelled at a reasonable cost plus proximity to running water. The land being levelled at present is in about the only site possible that fits these demands.
2. The present approach road is not satisfactory. It may never be entirely usable for passenger type vehicles but with improvements will be adequate for tractors and 4 wheel drive vehicles.
3. The slope on which the building area is planned and on which construction is in progress runs roughly north and south with the upper side south.
- (a) Starting at the high southeastern portion where the approach road may be extended a goat area is planned. The goat house is planned with slatted floor and walls built into the slope with a minor amount of land levelling. Surrounding the goat house and extending up the hill, pasture development will be a major activity over the next 2 years. As time and the seasons permit, hand plantings of setaria, guinea B, Napier grass and Brachiaria mixed with stylosanthes and centrosema will be extended. Hedgerows of gliricidia and leucena (ipel-ipel) will separate these pastures into sections of varying size. The hedgerows may be lopped to provide additional feed at dry periods of the year and will serve as a windbreak to reduce the dessication that occurs on these hills.

As a beginning goat herd 20 does and 4 bucks is being planned with at least 3 breeds represented. As the herd begins to enlarge the excess of crossbred animals are expected to be sold to local producers. The does will be milked in an area adjacent to the goat house. Although the goat project is being planned and land areas have been designated it does not appear to be possible to start until adequate financing is available. Therefore it has been labeled as Project No.2 and is superseded in the development plan by Project No.1 which includes Dairy, Rabbits, Ducks and Fish.

- (b) Dairy -

Northwestward down the slope a winding road leads to the dairy area. Above and below this road development of pasture and green

chopping sections similar to the goat pastures are being planted. Hand plantings of pueraria and velvet bean have also been made on the hills to improve the soil toward future pasture plantings. At widely spread intervals jak trees and gliricidia have been planted to serve as a wind break, provide loppings for feed and to add another food product.

The dairy building construction area lies on the portion of the slope that was least acute. Hand levelling of an area approximately 150' x 150' has been in progress and at completion will leave a vertical soil and rock wall 15' high at the upper side. At this vertical wall three round silos 10 feet in diameter by 15 feet in height will be constructed out of brick and mortar. They will be filled from a levelled area directly above them.

Adjacent to the silos to the north a dairy barn to house 24 cows plus office, feed room, calf pens and milk room will be constructed. To the west of the dairy barn the road proceeds down the slope. Under the road and piped from the dairy barn the liquid manure will flow to the bio-gas plant. Solids will either be liquified with extra water or brought to the bio-gas plant by wheel barrow across the road. Effluent flow from the bio-gas plant will proceed down the slope to algae pools or to the duck ponds.

On the same level as the dairy barn to the north a cow exercise area is designated where observations and heat checks may be made. Below this there is room for another 24 cow dairy barn for the future.

- (c) Below the dairy area a rabbitry has been constructed to eventually house 400 or more rabbits. The rabbits will be housed in cages which will be double decked. The upper portion of the walls will be open but covered with large opening mesh to admit light and provide ventilation. Additional pens may be built on a shelf to the east of this building if more space is required.
- (d) On the other side of a wet ravine area and below to the west of the dairy buildings the duck buildings have been erected. There is space for hatching, brooding and rearing for three separate breeds of ducks. In front of this structure there are three ponds which receive flowing water from a stone flume that has been constructed so that water may enter any pond by dropping a baffle plate in the flume. Effluent from the bio-gas plant may be directed into this flume directly or may reach an algae development pool previous to entering the flume.
- (e) As an addition to Project No.1 fish have been included to supplement the duck pond development and to provide another area of protein production. Three varieties of fingerling fish have been ordered and will be placed in the duck ponds soon. When success of this venture has been assured it is

planned to build additional larger ponds to the east of the dairy and rabbit areas where another strong spring flows down the slope.

- (f) Poultry other than ducks has not been included under Project 1 or Project 2 but is eventually to be developed down the slope from the entrance road and below the present office.
- (g) Just below the present office and possibly including the office a teaching, research and extension center is planned. This is not included in the present financing because the farm aspects must be developed first.
- (h) A much larger and more involved cattle breeding program is planned as Project 3. But this will again depend on availability of land, labor and financing in the future. Should this become a reality it will mean development of pasture acres and fences extending up the hill.

VI. CONSTRAINTS

1. Sloping land is not unusual to Sri Lanka and is a challenge that makes an interesting project out of this development program. However the extreme slopes at this location will add considerably to cost and will make almost every operation more critical in regards to management.

2. Road construction and maintenance will involve much more time and labor at this site than it might at a more suitable location. It is essential however that research workers and laborers be able to reach the fields and buildings with equipment and supplies.

3. Security may mean no less a problem at this location than it has already been at Dodangolla and Meewatura farms. There are villagers living nearby who have already begun to harvest some of the planted acres. Good fencing could help to eliminate this but it will be expensive.

4. Many planting and harvesting operations that could be carried out on a more gently sloping farm with equipment will have to be managed by hand. This will add to cost and would be prohibitive if labor costs were to rise considerably in relation to saleable produce cost. Since a major part of the dairy feed will have to be hand cut and carried the cost may already be out of line with reality.

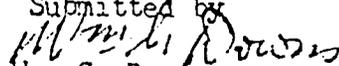
5. These acres are quite acid and infertile. Erosion has already washed away most of the good soil. The cost of rebuilding the soil and fertilizing for optimum production will be excessive but again if this is to be a demonstration of the suitability of abandoned tea estates for livestock production the outcome may be worth the price.

6. Many man hours of hand weeding will be necessary before good stands of suitable grasses and legumes have been established. Like the other hand operations this will only be economical while wages are low. In several trials with chemical weed control the cost has been too high for the quality of control.

7. At present there is no electrical entry to the farm. This may be overcome at some cost or it may be possible in the future to replace electrical power with methane generation but at some point milk cooling will have to be accomplished.

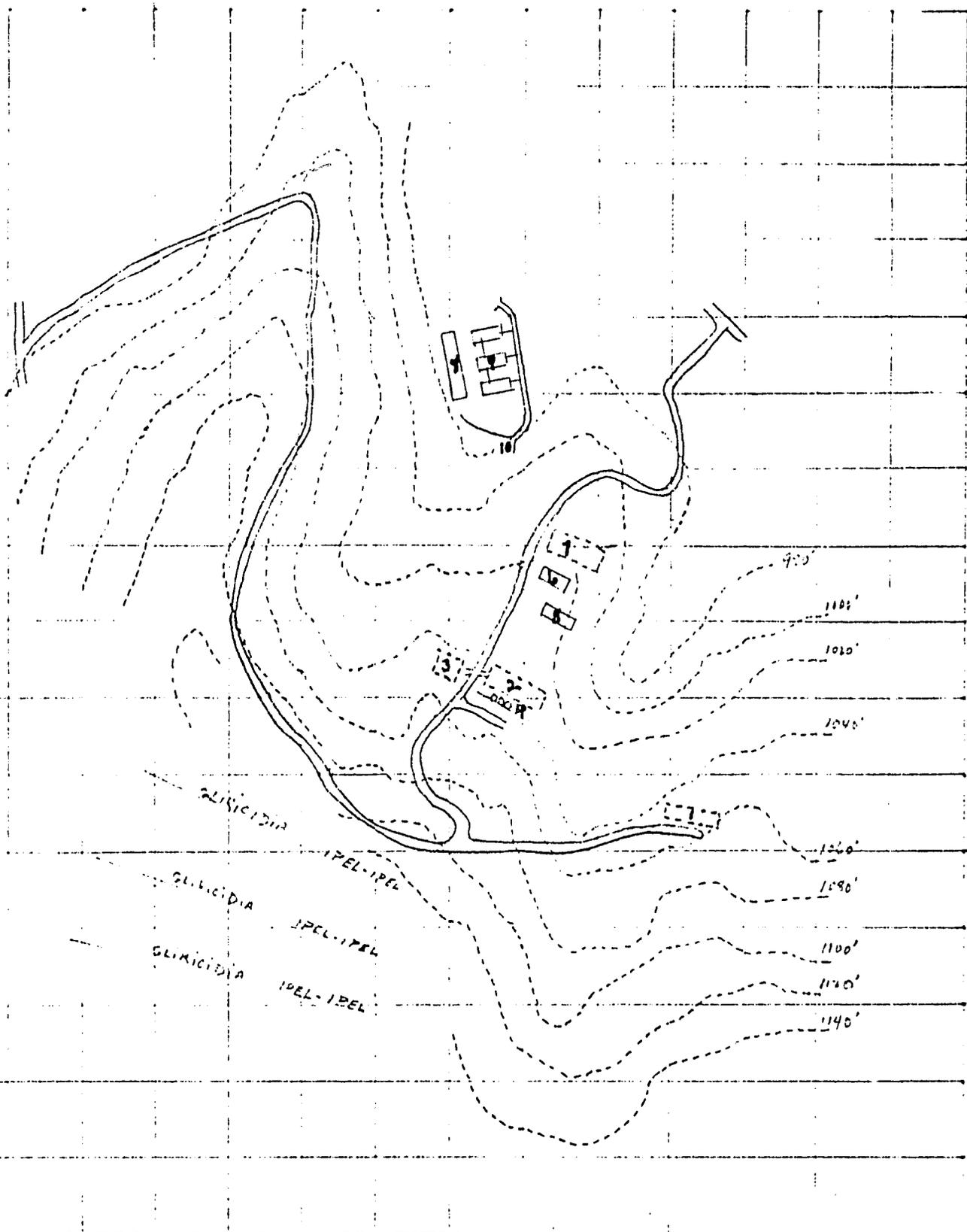
8. A major drawback at present is the lack of laboratory or teaching facilities. Changes in the plans should include these at the earliest opportunity. It might be better to forego some production facility until these needs have been met.

These major constraints show a need for additional planning and development work but perhaps the most important need will be management dedicated to the task of making the program work.

Submitted by

Wm. G. Downs

Experiment Station Development Specialist

A. E. D.



- | | |
|------------------|---------------|
| 1. GOAT BARN | 6. FIELD |
| 2. DAIRY BARN | 7. CLASS ROOM |
| 3. BIO-GAS PLANT | 8. DUCK BARN |
| 4. SILOS | 9. PONDS |
| 5. RABBITRY | 10. FLUME |

ANIMAL HUSBANDRY LIVESTOCK FIELD LABORATORY
SCALE 1/2" = 100' 0"
NFM-SALGADO-NGD

FACULTY OF AGRICULTURE
UNIVERSITY OF PERADENIYA.

Botanigolla Research Farm Development Report
AID Project - University of Peradeniya

- I. Introduction
 1. History
 2. Size-location
 3. Soils
 4. Physical Features
 5. Climate
 6. Roads
 7. Buildings
 8. Current Use
 9. Equipment
 10. Labor

- II. Potential Use
 1. Crop-seed
 2. Livestock
 - (a) Buffalo
 - (b) Sheep
 3. Agrostology
 4. Research
 5. Teaching
 6. Extension
 7. Management

- III. Research Orientation

- IV. Constraints
 1. Transportation
 2. Security. Fences - roads
 3. Buildings
 4. Climate
 5. Irrigation System
 6. Equipment
 7. Labor
 8. Management

I. Introduction

1. Dodangolla Farm had been used for many years as a portion of the Kundasale Farm training school, directed by the Dept. of Agriculture. There was a history of low production or low income from these acres which were some distance from the main training area.

In 1968 the farm was given to the Faculty of Agriculture of the University of Peradeniya for research and training purposes.

2. There are 205 acres available for use including the roads which cross the farm and encircle several fields. It lies approximately 12 miles northwest of Kandy or about 16 miles from the campus.

3. A major portion of the soils are silty loams with relatively low organic matter. Generally the soils are low in phosphorous and potassium but not particularly acidic. Low residual nitrogen is common and is related to the low organic matter. The sandy soils on the upper portions are well drained and much of the land is mechanically tillable but is now planted in perennial crops.

There are also areas which are more poorly drained and are characterized by heavier soils with more clay. These are situated in the low sections and some paddy is being grown here.

4. The elevation is roughly between 1450 and 1550 feet above sea level with rolling hills the dominating pattern. Two streams border parts of the farm flowing south. Dodangolla Oya flows along the low side of the annual crops area and provides water to a 12' x 20' foot well. Water may be supplied to a higher well of about the same dimensions near the center of the annual crops by pumping.

There are remnants of barbed wire fencing on posts but much of the fencing is living closely spaced *Gliricidia*. In some cases the barbed wire is hung on the *Gliricidia*.

5. Annual rainfall is in the 70 inch range and the pattern is similar to the dry zone with a definite Maha and Yala season. The heaviest rains come in October and November with lighter rains in late spring. Temperatures are generally higher than the Kandy area but not as high as in the true dry zone to the north.

6. There is a total road area of about 8 acres with 3 acres under village control. Most of the roads are poorly graded and all are unsurfaced. Many gulleys and washes make it difficult for passenger cars. Most of the travel is presently by foot, cycle, tractor or 4 wheel drive type vehicle.

7. There are a number of buildings which were acquired with the farm. Most of these are old and run down or poorly suited to their use but are being used at present.

The listing is as follows:

- 1 Farm managers bungalow
- 1 Storekeepers bungalow
- 1 Dairy herdsman's bungalow
- 1 Storage building 40' x 12'
- 1 Store building 40' x 15' (also house equipment)
- 3 Labor lines 20' x 10'
- 1 Seed Laboratory 100' x 15'
- 1 Round addition to seed laboratory 50' diameter with 6 rooms and open centre (new)
- 1 Dairy barn with office and milk room
- 1 Sheep shed

The major buildings including the barn and sheep shed obtain water from the local water system and have raised tanks for storage.

Three phase current has been brought to the major buildings and will be available for milkers, cooling, pumping water or any added laboratory equipment.

8. The present acreage and use is as follows:

- 20 acres annual crop area with about 15 acres planted to okra, egg plant, beans, chillies, tomatoes, beets, maize, cabbage and seedling tree crops.
- 68 acres coffee in various combinations for shade or companion cropping, mainly gliricidia or larger tree cover.
- 15 acres of cocoa planted with companion cover crops for shade.
- 22 acres of black pepper grown mainly on gliricidia for shade and support.
- 4 acres of paddy.
- 16 acres in mixed cropping system now being established.
- 26 acres in dairy pasture mainly brachiaria bryzantha. At present there are up to 55 animals of various ages on this pasture.
- 10 acres of sheep pasture mostly brachiaria with some stylosanthes as a legume. There are 50 to 60 sheep grazing this area.
- 11 acres which is designated as pasture but is seldom used because the villagers have taken possession.

The remaining acreage is either in roads and building area or is in brush or grass to be eventually developed.

Much of the perennial tree crops such as coffee or cocoa were inherited with the farm and could be changed to another crop when suitable.

A large number of seedling trees, budded or grafted stock is being grown for replanting or sale. These plants are produced near the seed laboratory where they can be watered. A temporary shade house has been erected but is quite inadequate.

In the same area several compost pits have been dug where excess tree trimmings, weeds and grass are added to soil to produce the bedding and transplanting soil. At present there are large number of new plants of coffee, cocoa and pepper being added to one area of the farm as a cropping systems project. The composted soil is added to the planting holes at transplanting.

9. A list of the existing equipment which is all ten or more years old follows:

- 1 - 25 Sri 6975 M/F Tractor x 4 wheeled
- 1 - Avery weighing scale 5 cwt
- 1 - Counter scale (Union)
- 1 - Disc Harrow
- 1 - Disc Plough Two Furrow
- 2 - Water Pump - Lister Engine 3 inch
- 1 - Water Pump - Petter Engine 3 inch
- 1 - Tank type sprayer
- 1 - Typewriter (Imperial)
- 1 - Tractor 2 wheeled (Land Master)
- 1 - " " " (Kubota)
- 1 - " " " (Noda)

Most of the equipment is in poor condition and was either inherited with the farm, given, borrowed or purchased in 1968.

10. At the time that the farm was turned over to the University 60 laborers were inherited as part of the exchange. According to local political custom these workers must reach retirement age in order to be dismissed. Many have no birth certificates and continue to lie about their age, as a result the farm still has 56 of the original laborers and is overloaded with aged and non-productive workers.

II. Potential Use

1. The present mixture of perennial crops, appear to fit the site and should be continued at some level. At this time some of the plantings of coffee and cocoa are not productive either because of age, disease or poor management and should be removed. New plantings should be made only after careful study. As a teaching and research tool it might be better to have a greater variety of crops rather than an extensive acreage of any one crop.

An attempt is being made to continue relatively large plantings of annual vegetable crops. Where these fit into an experiment or are produced for seed they should be continued but if the attempt is production for profit this should be discontinued. With the stress on management that excess labor of poor quality exerts this type of production is questionable.

The production of crops for seed purposes is a worthwhile intention and should be receiving greater emphasis. It has been recognized for

some time that acquisition of good seed of adapted varieties has been a major problem in Sri Lanka. Seed storage and processing facilities are difficult to find and the whole field of seed technology could become a valuable addition to the crop science department. With well trained technicians and good equipment a program of crop breeding and selection might also be introduced at a later date.

2. The existing livestock program consisting of dairy and sheep has for sometime been an unwanted step child. The management has not been satisfactory and the site is too far from the campus to get the supervision it deserves. There are presently too many dairy cows for the productivity of the land.

It is intended to shift the dairy herd soon to the new Livestock Field Laboratory near the campus and to develop a herd of buffalo for the Dodangolla site.

(a) There will be an attempt to upgrade the buffalo herd by introducing two Indian breeds into the indigenous herd. The size of herd should not be over 25 because of the productivity of the land. In addition provision must be made for stored forage so that the herd does not suffer from malnutrition during the dry season.

(b) The sheep flock should be continued at some level but with much better management than is presently the case. There should be a dip tank or a careful spray program initiated to reduce the tick population. The flock should be sheared periodically if only to make the animals more comfortable. A stored forage program should be started to provide additional feed in the dry season. The breeding program should be truly research oriented to develop a flock of crossbred ewes that fit the climate and produce a desirable carcass.

The flock is at present put into the sheep shed for night housing so early that they miss the best evening hours of grazing. Management should understand that the production of meat is dependent on the greatest intake of quality forage possible. This cannot take place during the hottest hours of the day.

3. Regardless of the type of agrostology studies that may at some future time take place at Dodangolla there is an immediate need for pasture development. The limited acreage that exists has been heavily overgrazed and consists of only one species. Although the *Bracharia bryanthia* may be a satisfactory grass for the site there should be an attempt to add legumes to make a better ration for all types of livestock.

There should also be an attempt to fence the total area into a number of paddocks so that some areas may recover before being grazed. This would not only produce more total quality forage but would also cut down on the tick population. It would also allow certain fields

to be available for stored forage to be ensiled during the wet season. Another possibility would be to make special plantings each year for this purpose which could be seeded to legumes to gradually upgrade the total acreage.

4. Assuming that several constraints such as security and transportation to the farm can be overcome the Dodangolla Farm has greater potential as a research farm than either Meewatura or the Livestock Field Laboratory. There is enough acreage of similar type soils to work with. Although the weather is dry it is more predictable and provision can be made to irrigate. For certain crops it is more representative of most of Sri Lanka.

5. As a teaching facility, the location is a great drawback. Since the undergraduate student will already have had an opportunity to work at the Mahalluppallama site in the dry zone there should be no need for him to spend much time at Dodangolla. A few individuals might use the site for their senior projects but wholesale use by undergraduates would not be necessary. A field trip during each year might be considered as adequate contact time for the average student. Practical farm training is a valuable part of the students program but as the library develops and additional well trained lecturers return to the campus there should not be time to travel the distance to Dodangolla for class-work.

Students involved at the Post Graduate level would be more likely to use the farm as a research site and would not come under the same category as undergraduates.

6. As a site for extension activities the farm has several things to offer. With development a large number of crops will be represented. There will be some livestock there and if the management is satisfactory there will be a chance to show improved practices.

Many former graduates will be familiar with the Kundasale School, they may be more willing to return to a place nearby.

At present the farm does not have adequate facilities for large scale extension meetings. There would be a lack of feeding capability and overnight accommodations are not possible. If the cost of this type development is not excessive there might be some rationale to plan accordingly. It would appear however that there will never be enough features to make it more desirable as an extension center than the main campus at Peradeniya. If this is the case then any money invested in an extension center could be better used at the University campus.

7. There are adequate acres, value in crops, enough research projects and livestock to require outstanding full time management at the farm. Too often in the past the management has been haphazard with the manager often absent, particularly over the weekends.

With the problems of labor and location inherited with the farm there will have to be more careful supervision than previously practiced.

Overall management should be on the crops side. An assistant would be designated for livestock but answerable to the manager. The manager should be someone who understands equipment and should have the authority to order parts and see that equipment is serviced and repaired properly. To do this it will be necessary to have at least a moderate workshop which is supplied with electricity and water. There should be no question of security for tools and parts.

III. Research Orientation

Regardless of whether the farm is considered a research, teaching or extension facility it will be most important to develop an attitude of research as the primary goal.

An orientation toward production for profit cannot be allowed to confuse the worker or the management. This is not to defend unnecessary spending but rather to put research in the proper perspective.

Acres of crops that must be harvested leads eventually to production orientation. If the crops are not being harvested toward a research goal then they should be removed and the acres used for another project. Having acres planted just to keep the labor busy is another side of the same problem. A way must be found to have only productive labor at work. It will be a waste of good management to have an excess of poor labor to be supervised and watched constantly.

IV. Constraints

1. The distance of 16 miles from the campus to the Dodangolla Farm is probably the greatest single deterrent to the usefulness of this site. Public transportation is cheap but wastes much of a person's time. At this time there are not enough University vehicles to move students, research workers or supervisors to the farm when necessary. Even if the vehicles become available the cost of fuel is rising so rapidly that this will be another item to raise the price of using this site.

2. The village roads leading through the farm give easy access for poachers which is a common complaint. In addition the inherited labor system also contributes to a loss of crop production. These labourers commonly took home their considered share and the practice has not been controlled completely. Reduction of total acres used for research with good fences and closer supervision may be a part of the solution. A fuller solution might be to close the roads to village traffic and hire new labor to harvest research plots. Losses under a production orientation are serious. Under a research program they destroy the whole usefulness of the project.

The area which should be livestock pasture is heavily used by the villagers. Apparently this was not only an inherited problem but to evacuate the villagers and their cattle may take some political activity. The possibility of losing control of ever increasing acreage exists. The matter should either be settled with the local leadership or the area should be patrolled and fenced to make it absolutely a part of the livestock acreage.

3. There are a number of buildings which do not suit their uses at present. A rebuilding program should be started with a master plan to add one or more buildings each year until a reasonable level of workability has been reached. The first building that should be designed and built should be an equipment shed and workshop. Another would be a sizeable and well designed shade house. Other buildings can be fitted into the plan as financing becomes available.

4. Since the farm is in the dry zone there is a yearly pattern of low rainfall. For the livestock farm this means a serious shortage of forage at some times of the year. Conservation of forage during the wet season will be essential even if it adds to cost of labor and equipment.

For the annual cropping systems it means attention to irrigation and the added labor for this practice. For the perennial cropping system it means reduction in yield with little that man can do about it.

5. The present irrigation system is inadequate and in poor condition to keep anywhere near the total acres of annual crops growing at a maximum rate. Even though new equipment may be purchased it will also be necessary to enlarge the available water supply. It probably will never be possible to irrigate all 20 acres of annual crop land. Some acres will only be usable during the wet season.

6. The present equipment is old and except for a few pieces should be replaced. There should be one 4 wheel tractor purchased for use on both the crops farm and the livestock farm but the same man should operate and service the tractor to avoid unnecessary bickering between departments.

A serious drawback to disease and insect control on the perennial tree crops is the lack of a tractor powered sprayer. The same sprayer with minor modifications could be used for livestock spraying if the right type of unit can be purchased.

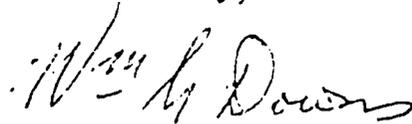
The existing seed laboratory is that in name only. There is not enough equipment nor is there any type of controlled atmosphere storage. Until there is processing, testing and storage equipment there will be no possibility of seed technology development.

7. Serious consideration should be given to a complete change in the farm labor crew. Whether there are political implications or not the present situation cannot be allowed to continue. If a University Experimental Farm is only going to be a system of patronage for over-aged workers then it might just as well close up shop. Large numbers of non-productive workers put too much strain on management and reduce the effectiveness of even the best man that can be hired.

8. Several of the strains that exist for management at the farm have already been mentioned. Labor, security, poor equipment, inadequate buildings and a policy of production for sale all contribute to a system that reduces management effectiveness. Although most of the sales are handled by a storekeeper who also keeps the books this phase also is under the final control of management.

To keep the farm working smoothly there should be a constant attempt to improve each unsatisfactory condition. Professional staff should give positive assurance backed up by action that improvements are being effected. Frequent timely consultation with the manager will help to keep everyone alert and active. Policy guidance toward research and away from production will give the manager a true sense of his value to the farm, the University and the country. The pay he receives won't do the job, he must be dedicated, but he will need help.

Submitted by,



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Experimental Farm Development Specialist
AED PROJECT

SUPPLEMENT NO. 1

to

Section XC - Plan of Implementation
Agricultural Education Development Project

Current (March 1980) life of project cost projections, adjusted for inflation and revisions from the 1979 operational plan, are summarized and compared with the existing contract budget in Table 1. These projections exceed the existing contract budget by \$2.28 million in total, representing an increase of nearly 38 percent.

A series of assumptions concerning future inflation have been made for the purpose of developing realistic Project cost projections. Although based on judgments of knowledgeable people in government, travel and transportation companies, equipment suppliers and procurement offices, and of CAED Consortium members, such assumptions are obviously subject to numerous imponderables. Likewise, Project needs and progress will be subject to pressures beyond its control. Therefore, it will be necessary to update both assumptions and requirements periodically throughout the course of the Project.

An overall average annual inflation rate of 14.1 percent, corresponding to the rise in consumer price index for the 12 months ending 28 February 1980, has been assumed in calculation of the estimates presented in Table 1. (Inflation for 1980 was projected at an annual rate of 19 percent in March by the U.S. Government.) Assumed annual inflation rates for the various categories of cost used in the current revision are as follows:

	<u>Assumed annual inflation rate (%)</u>	
	<u>Prime contract</u>	<u>Subcontract</u>
Salaries and wages	10	8
Consultants	10	--
Travel and transportation	20	20
Other direct costs	15	15
Overseas allowances	15	15
Equipment	15	--
Participant training	--	12

Increases in prime contract indirect costs are estimated at 13.6 percent annually, reflecting anticipated increases in approved overhead rates. No additional inflation factor is required for employee benefits as they are determined on the basis of a given percent of salary.

Home office costs in the prime contract include all salaries and wages, benefits, and travel and transportation for Washington-based personnel associated with the Project, other direct costs, and overhead on the fore-

Table 1. Current (March 1980) life of project cost projections, adjusted for inflation and plan revisions, as compared to existing contract budget.

	Existing contract	Current Projection	Difference
	\$	\$	\$
I. PRIME CONTRACT			
A. Home office	387,290	609,735	222,445
B. Field office	682,315	1,165,427	483,112
C. Equipment	1,539,729	2,126,876	587,147
D. Other	--	215,000	215,000
Subtotal: <u>Prime Contract</u>	<u>2,609,334*</u>	<u>4,117,038</u>	<u>1,507,704</u>
II. SUBCONTRACTS			
A. Training	1,536,241	1,787,536	251,295
B. Technical assistance	1,380,682	1,829,167	448,485
C. On-campus support	521,614	594,483	72,869
Subtotal: <u>Subcontracts</u>	<u>3,438,537*</u>	<u>4,211,186</u>	<u>772,649</u>
<hr/>			
GRAND TOTAL	6,047,871	8,328,224	2,280,353
<hr/>			

* These do not correspond directly with the existing contract as written as some adjustments were made during negotiation of the subcontracts which resulted in some shifts from sub to prime contract.

going. In addition to the inflationary increases based on the above-stated assumptions, the only major change has been to increase the Consortium Coordinator to fulltime for the initial three years of programming (earlier projected as a three quarter time position). Experience to date has demonstrated the need for this increase in level of effort.

Prime contract field office costs include: salaries, wages, benefits, allowances and travel and transportation (international and local) for field office based prime contractor expatriate and national personnel; in-Sri Lanka housing, travel, per diem and other local support costs for subcontractor personnel; a portion of the travel and per diem costs for annual inspection trips to U.S. by the Project Director and Co-Director; other direct costs; and overhead on all the foregoing except allowances. Percentagewise, the increase in this overall category is greater than in any other.

Primary contributing factors to the increase in projected field office expense include: extension of the Chief of Party position; cost increases in various allowances; travel and transportation increases that far exceed

the overall rate of inflation; direct inflationary increases. It should be noted that, although technical assistance costs are shown under sub-contracts, projected redistributions of assignments also affect the prime contract field office category to the extent that local support costs of visiting staff are increased.

The equipment line item is deceptive in that the current projections anticipate an overall increase of only about 38 percent. As shown in Table 2, however, the vehicle component drops due to elimination of funds for vehicles now to be procured by the host country. Life of Project projections for the equipment and library components of that line item, on the other hand, go up by 42.5 and 69.5 percent, respectively. These increases are due entirely to effects of inflation.

Table 2. March 1980 LOP cost projections by component of equipment line item as compared to existing contract budget.

	Existing contract	Current projection	Difference	
	\$	\$	\$	%
Vehicles	195,500	110,000	<85,500>	-43.7
Equipment	969,229	1,381,138	411,909	42.5
Library acquisitions	375,000	635,738	260,738	69.5
Equipment subtotal	1,539,729	2,126,876	587,147	38.1

The prime contract "Other" category in the revised estimates includes two items not previously budgeted, and two for which the levels of effort have been significantly increased (see Table 3). The contractor is now required by AID to pay participant trainees' insurance under prime contract, a requirement not anticipated at the time of contract negotiations. Although travel extensions were included in the existing contract, they were not specifically cited in the budget. With increased costs resulting from inflation and the need to authorize some supplemental travel in addition to per diem, it is desirable to identify this item in the current projections.

The increase in budget necessary to permit both the Director and Co-Director (PGIA Director and Dean of the Agriculture Faculty) to make annual inspection trips to the U.S. is included in "Other". Also, \$100,000 have been projected under the heading of "additional research supervision". This need was recognized in the existing budget, and some travel funds were set aside for this purpose. It is now clear that more will be required to assure top quality dissertation research by participants, research that is relevant to Sri Lanka's needs. This item will therefore supplement existing funds to permit on-site visits by up to 10 supervisors of participants' dissertations from the Consortium universities, and approximately an equal number of visits to the U.S. by Sri Lankan co-advisors to serve on committees for final examinations of participant trainees. Such visits will also contribute directly to professional improvement of senior Sri Lankan staff by providing them with opportunities to become familiar with research, teaching,

and outreach programs in their fields, and to interact with professional colleagues from the U.S.

Table 3. Other additional costs included in March 1980 LOP cost projections.

	\$
Student insurance	50,000
Additional research supervision	100,000
Director/Co-Director trips to U.S.	35,000
Travel extensions	30,000
"Other" subtotal	215,000

Increases in projected training costs are more modest than for some other budget categories, as assumed inflation rates are slightly lower than the overall average, and redistribution later into the Project is less pronounced than is the case with technical assistance. Two additional participants are included in the current projections.

Subcontractor technical assistance cost estimates are up about 32 percent in the revised projections. Although the level of effort has changed little overall, the number of assignments is now greater resulting in increased travel costs. Also, the level of effort is now nearly constant over five years rather than peaking in the first and second years, as before, thus exacerbating the inflation problem.

Subcontractor on-campus support costs are projected to rise with the overall rate of inflation.

No additional funding will be required in the immediate future to meet the increased costs discussed above, since the Project is already funded to the extent of six million dollars. Decisions taken during the current year will, however, be tempered by the life of project situation. Thus, it is important that the longer range need be brought to the attention of AID and the host country at this time with the request that early consideration be given to the matter.

SUPPLEMENT No. 2

to

Plan of Implementation

Agricultural Education Development Project

with reference to Sections III & IV

- Purposes:
- 1). To present current estimates of starting and completion dates of participant trainees, and the implications therein concerning completion of the Project.
 - 2). To compare, on a per case basis, the timing of projected visiting staff assignments with expected return dates of participant trainees to Sri Lanka for dissertation research.

1. Projected starting and completion dates of participant trainees.

Projections concerning participant training included in the Grant Agreement for AID Project 383-0049 and Contract No. AID/ASIA-C-1397 were limited essentially to the number to be trained to the PhD level.

Project Paper projections called for all participant trainees to begin their PhD training during the first two years of Project implementation. Through extended discussions among the PGIA, Faculty of Agriculture, USAID/SL, and the Contractor during 1979, it was determined that the pool of available manpower was too thin to expect to maintain desired standards of excellence among all candidates if the original schedule were to be followed. It was therefore agreed (informally) that departures for training should be distributed over three years instead of two.

It is still not possible to project starting and completion dates with certainty as circumstances beyond the control of the PGIA/Faculty may change the starting date for some individuals (a few cases of such shifts have already occurred as noted in Figures 5,7,8). Furthermore, not all trainees progress at the same rate so may require less or more time than projected from the norm.

Nevertheless, norms have now been established (Section IIIA, pp.22-23), about three fourths of the trainee candidates have been identified, and more information is available concerning their background and previous training. On these bases, estimated training schedules have been developed for each participant slot as shown in Figures 3-8. For the purposes of these estimates, the mid-point in estimated time required to complete coursework (and Masters, if necessary) has been used unless information available concerning the individual indicated that this period should be modified.

The number of participants expected to be in the United States for either course work or thesis writing and defense during each quarter through the life of the Project is shown in Figure 1. It will be noted that six trainees are projected to complete their training in mid-1986, three months after the

estimated completion date indicated in the present Contract. Although that projection is subject to change as discussed above, it now appears that some adjustment in Project completion date may be needed to permit these trainees to complete the requirements for their PhD degrees.

2. Comparison between timing of projected visiting assignments and expected return dates of participants for dissertation research.

The kinds of assistance to be provided to the PGIA/Faculty by visiting staff under the Project were defined in the 1979 operational plan (Contract No. AID/ASIA-C-1397, Appendix A, II 2, p.3) as follows:

- a. teaching
- b. curriculum review and development
- c. research program development
- d. outreach program development
- e. facilities planning and development
- f. experiment station development
- g. library development
- h. graduate degree research supervision

All of the above roles were taken into consideration in both Project Paper and Contract development in determining the kinds of visiting staff required and in scheduling the various assignments. Within the role as defined above, those projections have now been reviewed and updated according to the criteria cited in Section IVA, p.31.

As a result, visiting staff in the same or related field are expected to be in Sri Lanka at critical periods for dissertation research supervision of some 65 percent (26) of the participant trainees. There is no possibility of matching visiting staff with return of 17.5 percent (7) of the participants, as no technical assistance is programmed for those areas. For the remaining seven trainees (17.5 percent), efforts will be made to further adjust visiting staff assignments to match trainee returns in at least three (possibly four) cases. In addition, one PhD candidate should complete her training in time to provide major assistance to dissertation research of a later-starting participant in a closely related field.

In summary, presently programmed visiting staff are currently expected to provide substantive research supervision to between two thirds and three fourths of the participants scheduled for training under the Project.

The number of participants in Sri Lanka for dissertation research during each quarter is compared with the number of visiting staff at Peradeniya during the same period in Figure 2 (only assignments for which the visiting staff will be expected to provide research supervision are included). Although interesting in terms of giving an impression of level of activity, this figure is deceptive from the standpoint of any attempt to draw conclusions concerning the matching of the two components for reasons described below.

The authorized level of technical assistance (including increases requested in the Plan of Implementation) will not permit the scheduling of visiting staff in Sri Lanka throughout the period of dissertation research; nor is that considered necessary. It is important, however, that the principal dissertation research supervisor be with the trainee in Sri Lanka for at least a few weeks at a critical stage, usually at or near the beginning of the investigation. At other times, the Sri Lankan co-advisor and visiting staff in other disciplines are expected to provide needed direction.

Case by case matchings of participant returns and visiting staff assignments are shown in Figure 3-8. The two are considered to be matched if a shift in either of no more than three months will provide the desired overlap. The need for continued flexibility in scheduling, with the progress of the participant usually being the determining factor, must be re-emphasized.

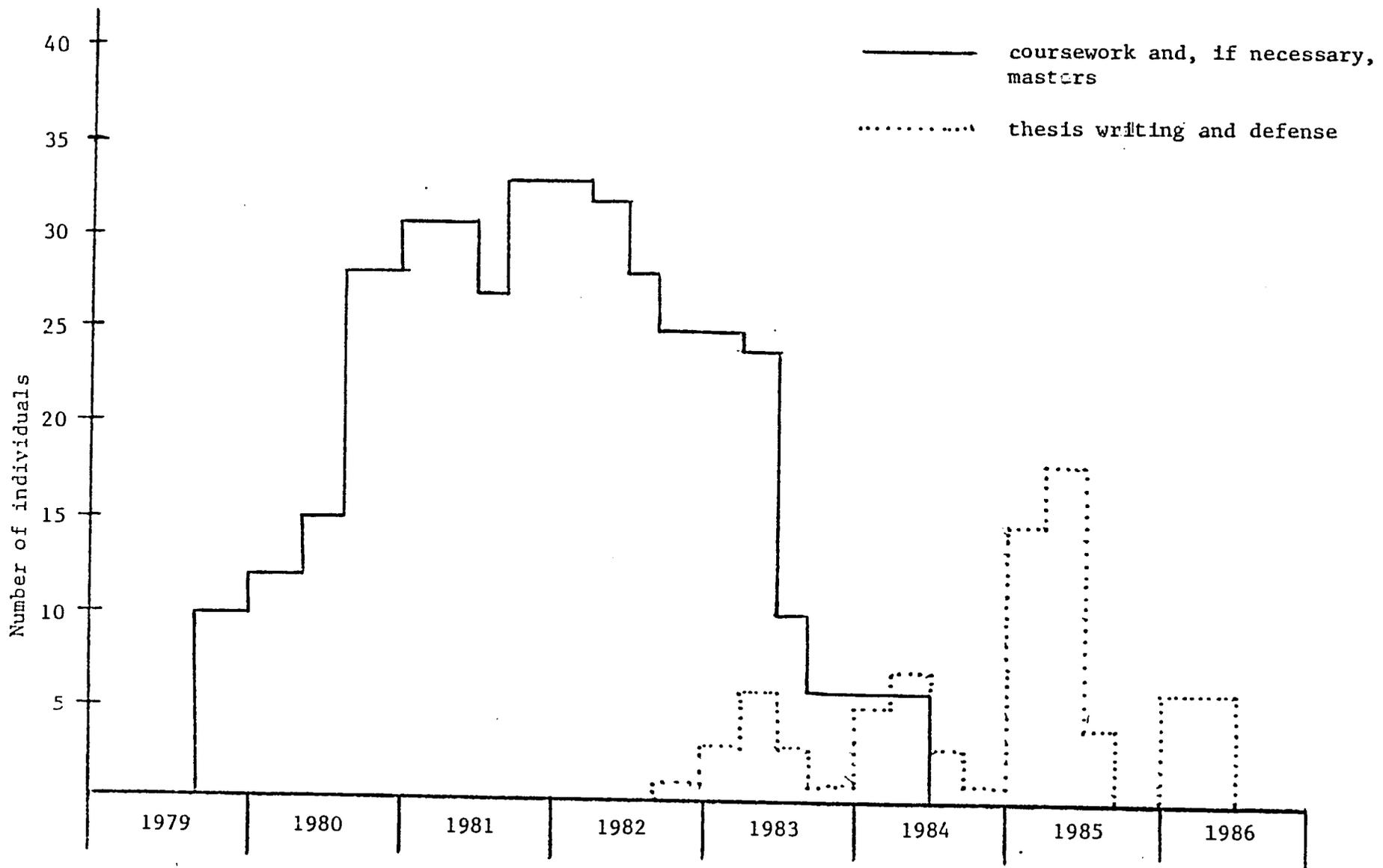


Figure 1. Number of participants expected to be in the United States for postgraduate training under the AED Project, by quarter, as projected in the Plan of Implementation.

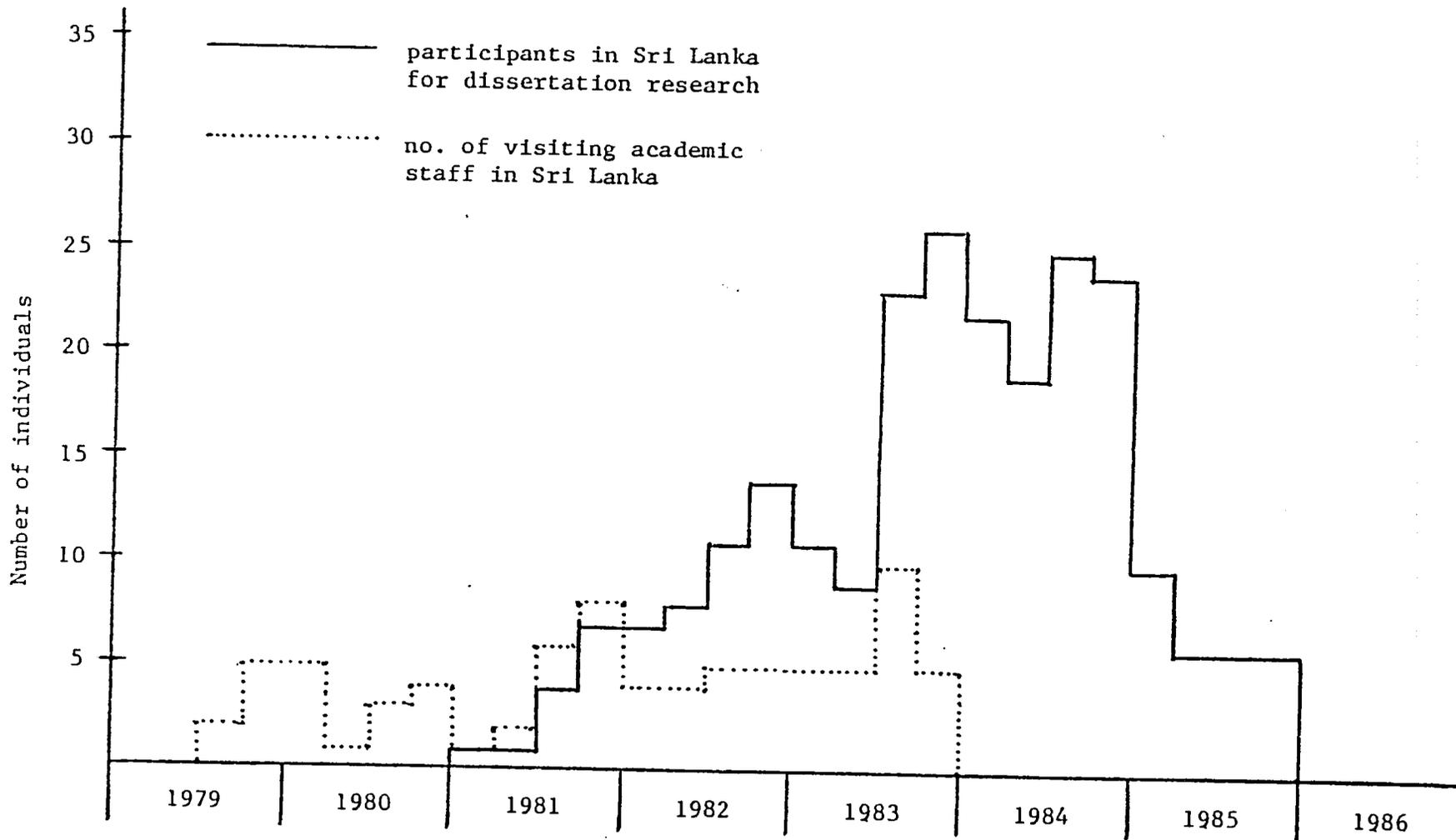


Figure 2. Comparison between number of participant trainees in Sri Lanka for dissertation research, by quarter, and visiting staff available in Sri Lanka for dissertation research supervision, as projected in Plan of Implementation.

Figure 3. Technical assistance programmed for the Department of CROP SCIENCE in relation to projected timing of participant training for the Department.

Area	Visiting staff Trainee	Year						
		1979	1980	1981	1982	1983	1984	1985
Weed Control	Hartwig Perera			|||||		|||||		
Agro-climatology	_____				|||||	|||||	◆◆◆◆◆	◆◆◆◆◆
Cropping systems	Hatley Ranamukaarachchi		|||||			|||||	◆◆◆◆◆	◆◆◆◆◆
Seed physiology	NONE					◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
Stress physiology	NONE						◆◆◆◆◆	◆◆◆◆◆
Postharvest physiology	NONE						◆◆◆◆◆	◆◆◆◆◆
Forestry-pomology (Fruit crops)	_____					|||||	◆◆◆◆◆	◆◆◆◆◆
Horticulture/ floriculture	NONE						◆◆◆◆◆	◆◆◆◆◆

||||| Visiting staff in Sri Lanka.

■ Trainee in U.S.

◆◆◆◆◆ Trainee in Sri Lanka for research.

Timing of participant training for the Department.

Area	Visiting staff Trainee	Year						
		1979	1980	1981	1982	1983	1984	1985
Food science	Kailasapathy		██████████ |||||	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆		
"	G. Ravindran		██████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆	██████████	
Soil physics	Erickson, Gingrich Yapa		|||||	██████████	◆◆◆◆◆	|||||	██████████	
Soil mineralogy*				██████████	██████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
Soil microbiology	Anderson				|||||	|||||	◆◆◆◆◆	◆◆◆◆◆
					██████████	██████████	◆◆◆◆◆	◆◆◆◆◆

||||| Visiting staff in Sri Lanka.

██████████ Trainee in U.S.

◆◆◆◆◆ Trainee in Sri Lanka for research.

* Trainee will major in soil morphology/classification with minor in soil mineralogy.

Figure 5. Technical assistance programmed for the Department of AGRICULTURAL BIOLOGY in relation to projected timing of participant training for the Department.

Area	Visiting staff Trainee	Year						
		1979	1980	1981	1982	1983	1984	1985
Entomology	Pienkowski, Kos., Dayawathie		|||||		|||||	|||||		
	"		██████████	██████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆	
	"							
Virology	Boyle Sriskantha		|||||	|||||				
	"		██████████	██████████	██████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
	"							
Plant breeding	Wickramasinghe			|||||	|||||	|||||		
	"		██████████	██████████	██████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
	"							
Crop physiology	NONE Bandara							
	"		██████████	██████████	██████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
	"							
Systematic botany	NONE Sumanasinghe**							
	"			██████████	██████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
	"							

||||| Visiting staff in Sri Lanka. ██████████ Trainee in U.S. ◆◆◆◆◆ Trainee in Sri Lanka for research.

* Expected to transfer to British Council scholarship.

** Rescheduled to start 9/80.

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Relation to projected timing of participant training for the Department.

Area	Visiting staff Trainee	Year						
		1979	1980	1981	1982	1983	1984	1985
Agricultural economics/mktg/finance	Harston Bogahawatte	|||||	████████████████████	|||||	◆◆◆◆◆	████████████████████		
"	Jegasothy		████████████████████	◆◆◆◆◆	◆◆◆◆◆	████████		
"					████████████████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
Communications	Tedrick, Sivayoganathan		|||	|||||	|||||	◆◆◆◆◆	████████	
Rural Sociology	Deegan Jayatilaka		|||||	|||||	████████████████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
Agricultural education	Holcomb Aponso		|||||	████████████████████	|||||	████████	◆◆◆◆◆	████████
Agricultural extension	Seastrunk, Ray Navaratnam		████████████████████	████████████████████	████████	|||||	◆◆◆◆◆	████████

||||| Visiting staff in Sri Lanka.

████████ Trainee in U.S.

◆◆◆◆◆ Trainee in Sri Lanka for research.

Figure 7. Technical assistance programmed for the Department of ANIMAL HUSBANDRY in relation to projected timing of participant training for the Department.

Area	Visiting staff Trainee	Year						
		1979	1980	1981	1982	1983	1984	1985
Swine Nutrition	Kornegay	||||			||||			
	V. Ravindran		████████████████████	████████████████████	████████████████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
Agrostology	Blaser	|||||			|||||			
	Panditharatne		████████████████████	████████████████████	████████████████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
"	- *			████████████████████	████████████████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
Animal physiology	Gwazdauskas	|||||					||||	
	Perera		████████████████████	████████████████████	████████████████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
Animal genetics	Marlowe	||||				|||||		
	Nadarajah		████████████████████	████████████████████	████████████████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
Ruminant nutrition	Fontenot		|||		|||||			
	NONE							

 Visiting staff in Sri Lanka.
  Trainee in U.S.
  Trainee in Sri Lanka for research.

* Re-scheduled to start 9/81.

Figure 8. Technical assistance programmed for the Department of AGRICULTURAL ENGINEERING in relation to projected timing of participant training for the Department.

Area	Visiting staff Trainee	Year						
		1979	1980	1981	1982	1983	1984	1985
Water management	Hale			|||||				
	Goonasekere		██████████	██████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
Soil conservation	Prathapar					|||||		
	Collins	|||||			|||||			
Waste management	Jeyanayagam		██████████	██████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
	Ariyaratne					|||||		
Farm machinery	Perumpral			██████████	██████████	◆◆◆◆◆	◆◆◆◆◆	◆◆◆◆◆
	Mills*		|||||			|||||		
Agricultural structures	NONE				██████████	██████████	◆◆◆◆◆	◆◆◆◆◆
	Basnayake**			██████████	██████████	██████████	◆◆◆◆◆	◆◆◆◆◆

 Visiting staff in Sri Lanka.
  Trainee in U.S.
  Trainee in Sri Lanka for research.

* Re-scheduled to start 9/80.
 ** Re-scheduled to start 9/81.