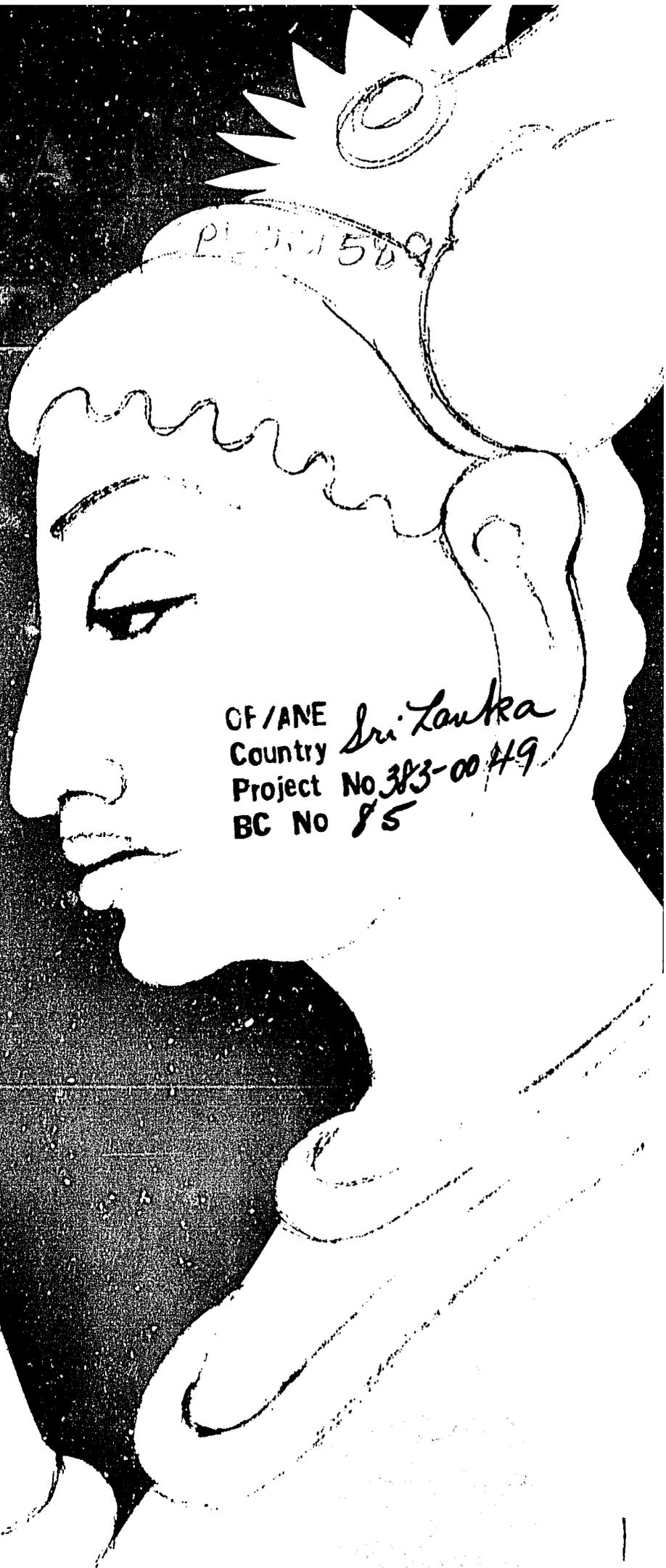


**Agricultural Education
Development Project**

Final Report 1979-1986

Academy for Educational
Development, Inc.
1255 Twenty-Third St., N.W.
Washington, DC 20037



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**SRI LANKA
AGRICULTURAL EDUCATION DEVELOPMENT
PROJECT**

**Final Report
1979-1986**

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September 1986

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FOREWORD

This report represents the culmination of more than 10 years of planning and action to enhance Sri Lanka's ability to meet its needs for agricultural personnel trained to the baccalaureate and postgraduate levels.

Soon after its founding, the Postgraduate Institute of Agriculture (PGIA) recognized that outside assistance would be required to enable it to achieve its goal—to provide high quality postgraduate education in agriculture to satisfy most of Sri Lanka's agricultural manpower needs. Under the leadership of Dr. R.R. Appadurai, then PGIA Director and Dean of the Faculty of Agriculture, the PGIA had prepared a development plan by early 1977 which was presented to USAID/Sri Lanka (and other potential donor agencies) with a request for assistance. During that same year the Faculty of Agriculture also prepared a plan for its future development.

In response to the PGIA request, the USAID Mission asked the Academy for Educational Development to send a team to Sri Lanka in late 1977 to conduct a study of the country's projected needs for trained agricultural manpower, and to work with the PGIA in further developing its proposal. The manpower study revealed the need to expand the Faculty of Agriculture and PGIA capacity in order to satisfy the anticipated demand for baccalaureate and postgraduate degree holders in agriculture during the next five to 10 years. The team recommended that assistance be provided to strengthen and expand the capacity of both the PGIA and Faculty of Agriculture.

A Project Grant Agreement between the Governments of Sri Lanka and the United States for the Agriculture Education Development Project was signed in August 1978, and a contract for providing technical services to the project was awarded to the Academy for Educational Development in consortium with Pennsylvania State University, Texas A&M University, and Virginia Tech University in March 1979. The Contractor's Chief of Party arrived in Peradeniya in early July, and the first 10 junior faculty members departed for postgraduate training at the three consortium universities in August and September. The record of solid achievement since that time is detailed in this report.

No report can fully capture the human elements that make such achievements possible, however. The leadership and dedication of the PGIA Directors and Boards of Study, and of the Faculty of Agriculture Deans, Department Heads, and Staff, were preeminent in this regard. The quality and high motivation of junior faculty selected for training, and the willingness of faculty who remained on campus to assume additional teaching loads while those junior faculty were in training were exceptional. Continuing strong support from the Chairman of the University Grants Commission and USAID officials were critical to the project's success. The dedication and commitment of Academy for Educational Development and consortium university administrators and staff were never in doubt. Undergraduate and postgraduate students also must be mentioned.

Thus, the story of the Agricultural Education Development Project is a story of many people—Sri Lankans and others—working together to achieve a common goal. The project also benefited from numerous projects supported by other donors who contributed significantly to achieving that same goal. The financial support received from AID and other donors was essential. But, it was the dedication, leadership, and hard work of these people that made it possible to translate that support into strengthened and expanded institutions and programs in spite of the serious communal and other problems encountered in recent years.

Howard E. Ray

*Vice President and Director
Agricultural Sciences and Technology*

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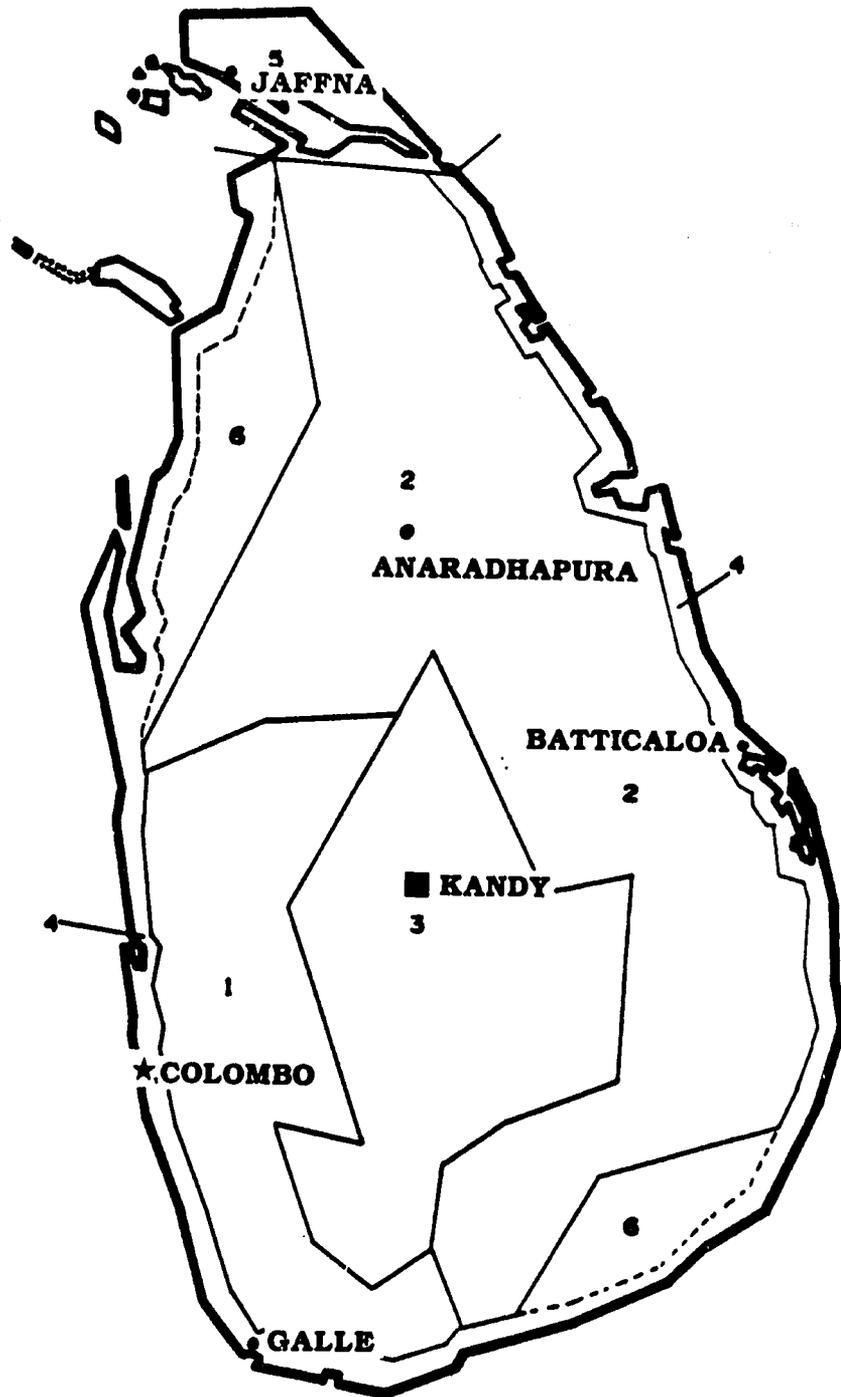
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Figure 1
Map of Sri Lanka



1. The wet zone plains of the Southwest
 2. The dry zone region of the North, East, and South
 3. The central highlands
 4. The costal belt
 5. The Jaffna peninsula and the islands
 6. The arid zones of the Southeast and the Northwest
- ★ Capital City
■ AED Project Field Office--University of Peradeniya

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1.0 BACKGROUND

1.1 Geography of Sri Lanka

Sri Lanka is a pear-shaped island near the southeast tip of India located in the middle of the Indian Ocean. Topographically it is made up of six general areas: the coastal belt; the dry zone plains of the North, East, and South; the Jaffna Peninsula and Islands; the central highlands; the arid zones of the Southeast and the Northwest; and the wet zone plains of the Southwest. Sri Lanka's flora and fauna include indigenous as well as imported strains that thrive under the natural environment, offering a variety unequalled by countries of the same size anywhere else in the world. Lush forests, jungles, brightly colored flowers, and fertile farmland make up the landscape of this island.

The coastal belt is a narrow strip which extends from the seaward border of the wet and the dry zone plains, circling the island. Located in this area are the cities of Colombo and Galle, the two major ports. Smaller cities and villages of various sizes are located along the coast. This area is famous for its beaches, sand dunes, and reefs, and thrives on tourism and commerce.

The dry zone region of the North, East, and South covers about three-quarters of Sri Lanka's territory and is made up of broad and hilly plains. This area has an annual rainy season from December to February and is traversed by 16 rivers. From ancient times, the Sri Lankans set up an intricate network of man-made lakes (tanks) and canals to use better the combination of rivers and rainfall which allowed them to practice cultivation. Several Sinhalese kingdoms had their capitals in this region until the 13th century. By the 18th and 19th centuries, the plains were greatly depopulated as these kingdoms moved closer to the Kandy area. This region is currently being redeveloped through restoration of ancient irrigation works and construction of new irrigation projects.

The Jaffna Peninsula, located on the northernmost tip of the island, contains some of the most highly cultivated farmland in Sri Lanka. Its bed of red soil with pools of trapped water results in another type of irrigation in which water is pumped out of limestone beds to irrigate rich fields of onions, tobacco, potatoes, chill, and palmyra palm. There are also a number of inhabited islands west of the Jaffna Peninsula.

The central highlands, historically a major cultural region and center of the last Sri Lankan kingdom, rises in steps from the plains to a series of plateaus and basins. In the last century, the British turned this once tropical forest into plantations. Village settlements occupy the valleys and plateaus. A small drier grassland is thought to have been occupied by primitive hunters and nascent farmers.

The wet zone plains of the Southwest form the area usually associated with old Ceylon stories made famous by chroniclers and story tellers. It is the wettest, greenest, and most densely populated part of the country. Rice fields, coconut groves, and rubber plantations cover this area. Spices such as cinnamon, pepper, cardamom, and nutmeg, among others, are grown here.

Although the arid zones of the Southeast and Northwest are sparsely populated today, one can find evidence of a once-thriving culture -- ancient irrigation works in the Southeast; vestiges of Sri Lanka's trade with India, China, Persia, and Rome in the Northeast; and the center of Sri Lanka's historic pearl industry in the Northwest.

Traditionally, Sri Lanka's economy has been largely agricultural, consisting of irrigated rice cultivation and three major commercial crops -- tea, rubber, and coconut. Almost half of the island retains its natural vegetation. Sri Lanka is also known for its gems and spices, although the contribution to the national economy is limited.

1.2 Colonial Agricultural Economy

During the British colonial period, Sri Lanka's economy was dominated by the production, processing, and shipping of three commodities -- tea, rubber, and coconut. Minor export products were principally spices. Since the three plantation crops combined to form 100% of Sri Lanka's export market during the Raj, the majority of arable land was devoted to these crops. The remaining farmland was taken up with the production of rice and other food crops for domestic consumption. To make up the balance to feed its ever-growing population, Sri Lanka imported most of its food staples. There was no domestic industry, and all manufactured goods were imported.

This agricultural export economy worked well under British colonial empire, as each colony produced specific raw materials which were traded for needed food and manufactured goods. As long as each colony remained one of the cogs in the empire's wheel, a stable economy was maintained overall.

Once the empire disbanded and the former colonies became independent states, each had to learn to compete in the international marketplace. It became risky to tie a former colony's total economy to the export of a few agricultural products that were subject to unpredictable natural and man-made disasters. A small fluctuation in the world market price of those few commodities could cause substantial fluctuations in the country's total economic welfare. In addition, the need to purchase food staples and manufactured goods on the open international market made these newly formed nations dependent upon a massive market structure over which they had little influence. Still, the colonial economic system of exporting agricultural products and importing food staples and manufactured goods remained the pattern of Sri Lanka's economy for the first 20 years of its independence.

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1.3 Modern Economic Patterns in Agriculture

Sri Lanka's independence from the United Kingdom in 1948 came during the aftermath of World War II. It was a difficult time for a young country to begin to change its economy from one that was dependent on the production and exportation of a few agricultural commodities and the importation of food staples and manufactured goods to one that was more balanced. The difficulty is illustrated by the fact that as late as 1965 a total of 86% of all imports were food and manufactured goods. At the same time, 97% of all exports were agricultural.

Beginning in the late 1960s, the government of Sri Lanka began a campaign to diversify its economy. More emphasis was placed on expanding domestic food production and investing in domestic manufacturing; export of non-agricultural goods was encouraged. By 1970 agricultural products accounted for 90% of exports. The seven percent drop from 1965 was absorbed mainly by a growing textile industry. At the same time that the export market was beginning to diversify, however, the country was still importing half of its food. More than 65% of its cultivated land was being used for the production of export crops. The remaining 35% was made up of family farms, using traditional agricultural methods. They were not able to produce sufficient variety or quantity of food to sustain the country's 13.5 million population.

In the early 1970s the government increased its emphasis on plans to develop its agriculture. It hoped to make the country self-sufficient in rice, the staple of the Sri Lankan diet, by the end of the 1980s. The plans for development expanded to devote substantial funds to opening new land for rice cultivation and increasing the yield of existing cultivated land. With the present regime's decision in 1977 to bring new lands under cultivation, a massive irrigation scheme, which was originally to be developed over a 30-year period, was accelerated to be completed in six years. This scheme would open up 600,000 semi-arid acres to domestic food crop production. To increase rice and other food crop yields, the government planned to introduce new agricultural technologies to the traditional methods of farming.

These plans for accelerated agricultural development demanded a large pool of skilled agricultural workers. The irrigation scheme required substantial numbers of plant, animal, and irrigation extension workers to help new farmers bring newly irrigated land into production. Traditional farmers would need assistance in implementing the new technology intended to increase their yields. Finally, the agricultural institutions involved in the development of the irrigation scheme and the adoption of the new agricultural technology would need more research, extension, and staff members.

1.4 Origins of the Postgraduate Institute of Agriculture

With these manpower needs in mind, the Sri Lankan government decided to upgrade the quantity and quality of its postsecondary agricultural education training system. It wished to obtain 80% of the needed professional agriculturalists from its domestic system of higher education. The University of Peradeniya's Faculty of Agriculture (FA) was the only higher education institution granting B.Sc. degrees in agriculture at the time. To meet the increasing demand for agricultural manpower training, the FA began expanding its curriculum and facilities. The Postgraduate Institute of Agriculture (PGIA) opened its doors for M.Sc. and Ph.D. students in 1976.

In 1977 the PGIA requested assistance from the United States Agency for International Development (USAID) to strengthen its library and laboratory facilities. It also asked for technical assistance to define research and teaching programs in specific disciplines. The total proposal called for the purchase of reference books and scientific journals for the library, procurement of research and teaching equipment, and the services of 10 visiting professors from one to two years each. The total cost was estimated at U.S. \$1 million for a period of approximately five years.

The USAID Mission in Sri Lanka (USAID/Sri Lanka) contracted with the Academy for Educational Development, a nonprofit development assistance organization, to conduct an in-depth assessment of the needs of the PGIA/FA. Specifically, a study was commissioned to:

- Analyze the supply and demand conditions for high-level and skilled manpower in the agricultural sector through 1985 and beyond.
- Present and evaluate alternative solutions for producing needed workforce at the technical and postgraduate level.
- Verify the feasibility of and identify the parameters of assistance needed to develop the capability of the PGIA to produce 80% of Sri Lanka's estimated agriculture and rural development sector requirements for M.Sc. and Ph.D. level workforce.
- Identify linkages whereby the PGIA and its graduates might positively affect the quality of life of the rural poor.
- Define present and planned linkages between the PGIA, the university system, the government, and the private sector to assist the Government of Sri Lanka in achieving its stated goals of food self-sufficiency, employment generation, and increased rural incomes.
- Determine government and PGIA budget implications and capacities to provide increased funding both during and after A.I.D. support of project development.
- Identify and produce scope of work for additional studies necessary to design and implement an A.I.D.-assisted development project.

1.5 Agricultural Manpower Study: Findings and Recommendations

For this study a survey was made of the manpower requirements of Sri Lanka's public and private agricultural institutions. The study projected that 84 postgraduate degree holders would be needed each year for the coming five years. If the PGIA were to satisfy 80% of this demand, it would need to graduate some 67 postgraduates each year. At the time of the survey (1977) the PGIA had 17 graduates and 37 new enrollments.

The survey also found that an average of 250 B.Sc. degree holders would be required each year for the following five years. A unique feature in the B.Sc. manpower demand was its decreasing size over time. That is, the institutions surveyed said they would need a total of 295 B.Sc. graduates in 1978; by 1982 they projected a fall in requirements to 206. At the time of the survey, however, the Faculty of Agriculture graduated 87 B.Sc. degree holders and projected only 100 for the coming year. Therefore, the supply would meet only 50% of the lowest projected demand of 206. For the PGIA/FA to meet these increasing demands for B.Sc., M.Sc., and Ph.D. graduates, the study recommended expansion of institutional capabilities in curriculum, research, staffing, facilities, and organization.

The study showed that the *curriculum* of the PGIA/FA was quite good. If anything, there was too much coursework, and there was some overlap of courses between departments. It was recommended that a curriculum committee be formed to review and revise the course offerings periodically. The committee would insure that the most current subject matter was taught and that a minimum of overlap occurred.

Research was found to be ongoing, but with little coordination among disciplines. The study recommended that an interdisciplinary task force be established to review PGIA/FA research activities with the objective of integrating research activities across departments and directing future research toward overall topical priorities of Sri Lanka.

Although the existing *staff* of the PGIA/FA was highly qualified, it was limited. There were not enough Ph.D. staff to teach all the curriculum areas offered by the PGIA/FA. In some specific disciplines, there were no core staff at all. It was recommended that visiting professors be brought in for one-to-two-year assignments to teach in those areas where no staff were presently trained. Additionally, short-term visiting staff were to be brought in for specific teaching assignments for periods of three to four months. The staffing report also suggested training 52 PGIA/FA staff to the Ph.D. level.

PGIA/FA *facilities and equipment* were found to be woefully inadequate. The study recommended that a plan for facility construction be developed to upgrade the agricultural sub-campus. The construction of new laboratories and classrooms was to take precedence. The equipment required to bring the research and teaching laboratories up to the level required for postgraduate training was estimated at U.S. \$1.1 million. Additionally, the study recommended that vehicles be obtained to facilitate staff and student transportation needed for field research and training.

With respect to the *organizational development* of the PGIA/FA, the study suggested that an Associate Dean for Research be added to coordinate all research activities, which would be tailored to complement the overall

agricultural policies and plans of the Sri Lankan government. A position of Associate Dean for Teaching was to be formed to oversee the continuous process of updating the curriculum. The positions of Faculty of Agriculture Dean and Postgraduate Institute of Agriculture Director were to continue to be vested in the same individual. Central research and scientific stores would be under direct control of the Dean and available to all departments. Finally, a system of research/experimental farms would be established for use in postgraduate and staff research, as well as undergraduate field instruction.

USAID/Sri Lanka designed a project to address these issues and issued a Request for Proposals (RFP) to select a firm that would implement it.

2.0 PROJECT OVERVIEW

2.1 Consortium for Agricultural Education Development Project

On August 31, 1978, a Project Grant Agreement for Agricultural Education Development (A.I.D. Project No. 383-0049) was signed between the Governments of Sri Lanka and the United States. USAID/Sri Lanka later contracted with the Academy for Educational Development -- in consortium with The Pennsylvania State University (Penn State), Texas A&M University (Texas A&M), and Virginia Polytechnic Institute and State University (Virginia Tech) -- to provide the technical services called for under the Project Grant Agreement over a seven-year period. Project offices were established in July 1979 at the University of Peradeniya and in Washington, D.C.

2.2 Project Goal

The overall goal of the Agricultural Education Development (AED) Project was to enhance Sri Lanka's ability to meet its increasing need for agricultural personnel with university training. The AED Project was specifically aimed at enabling the PGIA/FA to strengthen and expand their undergraduate and graduate programs. The PGIA/FA set an objective of doubling the number of B.Sc. graduates and tripling the number of M.Sc. and Ph.D. graduates by the end of the project.

2.3 Project Activities

To assist the PGIA/FA in meeting this objective, the AED Project provided the following institutional development services:

- Training of junior faculty members to the Ph.D. level at U.S. consortium universities.
- Provision of technical assistance by long and short-term visiting professors to help develop teaching and research programs.
- Purchase of research and teaching equipment, books and journals, vehicles, and computers.

Because of delays in project implementation beyond the contractor's control, the project was extended one year beyond the original completion date to 1986. By September 1986, the project had completed the following activities in the three major areas of project services.

Training: The consortium universities provided academic training to 39 participants -- 11 for Ph.D. degrees alone, 26 for M.Sc. and Ph.D. degrees, and two for M.Sc. degrees alone. An important and unique feature of the program was that most Ph.D. participants were to return to Sri Lanka to undertake their thesis research. By the end of the project, 23 participants had completed their training and returned to their duties at the PGIA/FA; six were in the final stages of completing their dissertations and were expected to return to the PGIA/FA

by the end of 1986. Ten participants had chosen to leave Sri Lanka for jobs in other countries. The problem of attrition is discussed in greater detail in the following section. Although not part of the original contract, short-term non-degree training also was provided for five PGIA/FA staff members in various technical fields.

Technical Assistance: The project provided 240.47 person-months of long- and short-term technical assistance to the PGIA/FA. Visiting professors from the consortium universities -- advisors to the Ph.D. candidates -- and other consultants taught courses, supervised participant research, participated in the design of new curricula and research projects, and worked in collaboration with senior PGIA/FA faculty members.

Procurement: The project procured technical laboratory, audiovisual, and farm equipment and spare parts for equipment maintenance, books and journals, and vehicles for the PGIA/FA. Personal computers, procured by trainees to facilitate their research, also became part of departmental facilities or the PGIA Computer Center.

2.4 Consortium Contributions to Project Beyond Contract

Assistance provided by the Consortium went beyond the formal provisions of the contract. In fact, throughout the life of the project, consortium members were responsive to additional needs of the PGIA/FA as they arose and developed new programs as appropriate. For example, the formal agreement called for training to focus exclusively on the junior faculty, but several senior faculty members from the PGIA/FA were invited to spend their sabbatical leaves, at no cost to the project, lecturing at the consortium universities. Each consortium university met the salary and other expenses of the visiting professors on these occasions. This willingness to exceed contract requirements whenever appropriate was apparent throughout the implementation of the project.

The U.S. universities used Strengthening Grant funds to send to Sri Lanka other members of their staff in addition to the project-funded advisors. These included experts in Agricultural Engineering/Irrigation and Animal Science from Texas A&M and in Agro-forestry from Penn State. Virginia Tech issued an invitation to a former participant to return and teach a summer course in 1986. Another former Virginia Tech participant submitted a proposal to AID/Washington for collaborative research between the PGIA and Virginia Tech, which was subsequently approved. Throughout the life of the project, the universities donated books, journals, and laboratory equipment to the PGIA/FA.

Another major contribution of the U.S. universities was to the spouses of several participants. Many received financial aid which enabled them to enroll in graduate programs at the consortium universities with the intention of working at the PGIA/FA upon return to Sri Lanka, thereby enhancing the potential manpower resources available to the PGIA/FA.

3.0 TRAINING

3.1 Participant Selection, Placement, and Academic Program

The first requirement of the AED Project called for long-term degree training to the Ph.D. level for 38 staff members from the PGIA/FA. The AED Project actually provided long-term degree training for 39 academic staff, plus short-term non-degree training for five support staff. The long-term training component was divided into 37 Ph.D. programs and two M.Sc. programs.

Through 1979, 1980, and 1981 academic staff from the PGIA/FA were selected to go for Ph.D. training in one of the three consortium universities: Penn State, Texas A&M, or Virginia Tech. (See Annexes 1, 2, and 3, for U.S. Universities' Final Reports.) Although the original plan called for all staff to be selected and to begin training by 1980, a delay caused by insufficient numbers of qualified candidates extended the selection process into 1981. This delay contributed to the eventual extension of the Project Activities Completion Date (PACD) from March 1985 to September 1986.

Participants were selected by University of Peradeniya officials, USAID/Sri Lanka, and the contractor's representative in the field. The active involvement of these institutions resulted in the selection of academically excellent participants. Once participants were selected and approved for admission at one of the consortium universities, they traveled to the United States for training. Most of the participants (26) needed to obtain both the M. Sc. and Ph.D. degrees.

A major requirement of the project was for all thesis and research topics to be submitted for review and approval by the Faculty of Agriculture Department Heads and PGIA officials. This requirement ensured that dissertation research related to topics of high priority for Sri Lanka's development.

The program was designed to allow students to complete all coursework at the U.S. universities and then return to Sri Lanka to carry out part of their research. In most cases, their U.S. advisors also traveled to Sri Lanka for part of that time to oversee the research and to provide advisory services to the PGIA/FA. The time spent in Sri Lanka brought participants back in touch with the reality of their own country. It served to demonstrate to them that relevant and sound research could be conducted in their own academic environment in the absence of the excellent equipment and support systems available in the U.S. universities. A major advisor was identified from within the student's department at the PGIA/FA who provided research guidance and support to the participant during his or her in-country research. Although the time spent in Sri Lanka added a few months to the time required for thesis development (as compared with the time needed to carry out the same research in the U.S., for example), it was considered essential to ensure the relevance of the research to Sri Lanka. Upon completion of the in-country research, students returned to their U.S. universities to complete their degrees.

3.2 Long-term Academic Training

The specific subject area of each training program was determined by the PGIA/FA. Taking into account Sri Lanka's variety in climate, terrain, crops, and indigenous flora and fauna, the PGIA/FA selected fields of training that would contribute the most to the efficient and swift development of agriculture in Sri Lanka. The fields of specialization were grouped within the disciplines of the six departments of the Faculty of Agriculture (see below).

Department of Agricultural Biology

D. Bandara	Completed her Ph.D. in Crop Physiology at Penn State and returned to duty in May 1986.
B. Dayawathie	Completed her Ph.D. in Entomology at Texas A&M and returned to duty in June 1984.
V. Sumanasinghe	Completed his Ph.D. in Systematic Botany at Penn State and returned to duty in June 1986.
I. Wickremasinghe	Completed her M.Sc. in Plant Breeding at Texas A&M and returned to duty in February 1982.

Department of Agricultural Chemistry

G. Ravindran	Completed her Ph.D. in Food Science at Virginia Tech and returned to duty in September 1983.
L. Yapa	Completed his Ph.D. in Soil Physics at Penn State and returned to duty in December 1983.

Department of Agricultural Economics and Extension

- C. Bogahawatte Completed his Ph.D. in Agricultural Economics at Texas A&M and returned to duty in January 1982.
- M. Jayatilake Completed his Ph.D. in Rural Sociology at Penn State and returned to duty in May 1986.
- A. Piyasena Completed his Ph.D. in Agricultural Economics at Texas A&M and returned to duty in September 1986.
- C. Sivayoganathan Completed his Ph.D. in Communications at Texas A&M and returned to duty in December 1982.
- A. Wickremasuriya Completed his Ph.D. in Agricultural Education at Penn State and returned to duty in August 1985.
- S. Zuhair Completed his Ph.D. in Agricultural Economics at Virginia Tech and returned to duty in September 1986.

Department of Agricultural Engineering

- K. Goonasekera Completed his Ph.D. in Hydrology at Virginia Tech and returned to duty in November 1985.
- N. Jayatissa Completed his M.Sc. in Agricultural Engineering at Virginia Tech and returned to duty in April 1986.

Department of Animal Science

- S. Panditharatne Completed her Ph.D. in Agrostology at Virginia Tech and returned to duty in January 1985.
- K. Perera Completed her Ph.D. in Animal Physiology at Virginia Tech and returned to duty in September 1986.
- V. Ravindran Completed his Ph.D. in Animal Nutrition at Virginia Tech and returned to duty in July 1985.

Department of Crop Science

- C. Peiris Completed his Ph.D. in Seed Physiology at Penn State and returned to Sri Lanka in April 1986.
- A. Perera Completed his Ph.D. in Agro-Forestry at Penn State and returned to Sri Lanka in March 1986.
- S. Ranamukaraachchi Completed his Ph.D. in Crop Systems at Penn State and returned to duty in July 1985.
- R. Thattil Completed his Ph.D. in Biometry at Virginia Tech and returned to duty in November 1985.

3.3 Participants in Training after PACD

To date, six participants have not presented their thesis defense. They will complete their programs from a few weeks to a few months after PACD. They all have requested extensions of their study leaves from University of Peradeniya officials. They will not receive any educational or maintenance allowances after PACD. They are:

- A. Ariyaratne Completed M.Sc. thesis in mid-1985, completed Sri Lanka portion of Ph.D. research in late 1985; returned to Sri Lanka without completing Ph.D. degree; has resumed duties at the Faculty of Agriculture.
- P. Chanmugathas Completed the Sri Lanka-based portion of her Ph.D. research early in 1985 and returned to Penn State. She expects to complete her Ph.D. degree in Soil Microbiology by December 1986.
- A. Jayasekera Completed field research late in 1985 and returned to Virginia Tech/Utah State. She expects to complete her Ph.D. in Water Management by December 1986.
- S. Pararajasingham Completed Ph.D. field research in mid-1985 and returned to Penn State. He expects to complete the Ph.D. requirements in Stress Physiology by November 1986.
- N. Rajapakse Completed Sri Lanka data collection for the Ph.D. thesis in late 1985 and returned to Texas A&M. He is expected to complete Ph.D. in Post-Harvest Physiology by November 1986.
- S. Rajapakse Completed Sri Lanka data collection for the Ph.D. thesis in late 1985 and returned to Texas A&M. She is expected to complete her Ph.D. in Horticulture by November 1986.

3.4 Attrition Among Long-term Academic Training Participants

In 1982 one participant was not accepted into the U.S. university Ph.D. program after completing the M.Sc. degree and returned to duty at the PGIA/FA. A second staff member studying at a U.S. consortium university did not maintain an adequate grade point average to remain in graduate school and was dropped from the program when he refused to return to the PGIA/FA. Since the AED Project had budgeted him to be trained to the Ph.D. level, his early departure opened up the possibility of training new PGIA/FA staff members. It was decided that sufficient funds and time remained to train two new staff members to the M.Sc. level. By the end of 1982 two candidates were submitted for admission to the U.S. consortium universities; only one of the staff members was accepted for M.Sc. training. This brought the total long-term degree training count to 36 Ph.D. candidates, two M.Sc. candidates, and one terminated participant.

In 1984 two staff members in training for Ph.D. degrees were dropped from AED Project support when they refused to return to Sri Lanka for their dissertation data-collection, and one other resigned six months after his return to the PGIA/FA. In 1985 four staff did not return to assume their duties once they had completed their degrees. In 1986 two more staff have not yet reported for duty after the completion of their training in August.

G. Fernandes	Completed his Ph.D. in Pulse Breeding in December 1985, but did not return to duty.
K. Jegasothy	Completed his Ph.D. in Agricultural Economics in December 1984, but did not return to duty.
S. Jeyanayagam	Dropped from project support in October 1985 before completing his Ph.D. in Agricultural Engineering. Completed Ph.D. outside of project support.
K. Kailasapathy	Completed his Ph.D. in Agricultural Chemistry at Penn State and returned to duty in October 1982; resigned from post in June 1986.
R. Mills	Dropped from project support in 1982 before completing his Ph.D. in Farm Power/Tillage.
K. Nadarajah	Completed his Ph.D. in Animal Genetics in September 1985 but did not return to assume duties.
K. Navaratnam	Dropped from project support in August 1984; completed his Ph.D. in Extension Education outside of project support.
L. Perera	Returned to duty with his Ph.D. in Agronomy in January 1984, but resigned his post in June 1984.
S. Prathapar	Completed his Ph.D. in Soil/Water Conservation, returned to Sri Lanka in August 1986, but has not reported for duty.
P. Puvirajasinghe	Completed his Ph.D. in Agroclimatology, returned to Sri Lanka in August 1986, but has not reported for duty.
S. Rajakulendran	Dropped from project support in September 1984; completed his Ph.D. in Entomology outside of project support.
A. Sriskantha	Completed his Ph.D. in Virology at Penn State and returned to duty in November 1984; resigned post in June 1986.

Participant attrition experienced by the AED Project is symptomatic of the tremendous 'brain drain' now affecting Sri Lankan institutions generally. While the failure of 10 participants to return to Sri Lanka lowers the overall effectiveness of the AED Project, neither the PGIA/FA nor the consortium member institutions could do much to alleviate the underlying economic stress and communal insurgency which provoked the resignations of these faculty members.

Attrition in the Sri Lankan university system was one of the topics discussed at length during the June 6, 1986, meeting between Consortium Council members, USAID/Sri Lanka officials, and University Grants Commission (UGC) officials in Colombo. The fact that over 250 participants in various higher education projects have elected not to return to Sri Lanka upon completion of training was a major concern, and steps were being considered by the Government of Sri Lanka to correct it. It is the hope of all personnel involved in the implementation of the AED Project that these former participants will eventually return to Sri Lanka and contribute to the further development of its agricultural sector.

3.5 Short-term Technical Training

Although the contract did not call for any short-term specialized non-degree training for support staff, it became apparent that the expansion of PGIA/FA academic and research activities was placing heavy demands on the non-teaching staff.

Therefore, in 1982 it was determined that specialized skills training would be made available for some support staff.

The first specialized training program was conducted by Penn State for the PGIA/FA Assistant Librarian. The PGIA/FA library was receiving approximately 2,000 new reference books and 63 journal subscriptions annually from the AED Project. This large influx of publications taxed the library staff to its limits. They were not able to keep up with cataloging and shelving these publications, nor with the ordering or delivery schedules. It was suggested by the PGIA Librarian that his assistant receive training in the operations and management of a scientific library. The AED Project had originally scheduled three months for a librarian from Penn State to assist the PGIA/FA library in upgrading the collections, but only one month of that time had been used. Therefore, the AED Project set aside funds that had been earmarked for the remaining two months of librarian technical assistance to be used for three months of non-degree training for the PGIA/FA Assistant Librarian. The actual training program took place in the summer of 1984 at the Penn State Life Sciences Library.

In 1985 it was determined that not all the technical assistance time available for visiting professors had been allocated to specific requirements. The PGIA/FA identified 15 additional months of technical assistance and 11 months of support staff training. Some of the remaining technical assistance funds were transferred to short-term training to pay for the additional 11 months of technical training.

In 1986 four non-academic staff members of the PGIA/FA were given specific skills training at Virginia Tech. A three-month training program was designed for the technician responsible for the operations and management of the PGIA/FA Instructional Media Unit. This unit had been built and equipped to produce audiovisual and print materials to be used in the PGIA/FA's teaching and outreach programs. No permanent staff had been assigned to it until early 1986. A part-time staff had been temporarily assigned to the unit in 1985 to learn how to operate the sophisticated audiovisual equipment, but no training had been given to them in the methodology of instructional media design, administration of a media training center, or cost of productions. Once the permanent position was filled in 1986, an instructional system training program was undertaken at the Learning Resource Center of Virginia Tech.

The Department of Agricultural Engineering had set up through the AED Project a sophisticated hydrology laboratory to facilitate its work with the management and engineering of irrigation systems. It needed to train its technicians in the calibration, operation, and maintenance of the various pieces of equipment that made up the units of the laboratory. The emphasis of the training program was on skills acquisition in hydrology. The technician worked for a three-month period in actual field data-collection of streamflow, climatic, and meteorological events at Virginia Tech.

For the PGIA to increase enrollment substantially, it had to reorganize and systematize its administration of student admissions, student scheduling, course scheduling, and general office administration. The Registrar of the PGIA spent two months with the Assistant Provost of Virginia Tech learning graduate program administration through hands-on instruction. The PGIA Registrar studied computerized student record systems and course scheduling in detail.

The Department of Animal Science obtained substantial laboratory equipment related to its expanded research in improvement of animal feed and fodder, animal reproduction physiology, and processing of dairy products. Much of this equipment was sophisticated electronic and, in some cases, radioactive measurement equipment. In order for the equipment to be used properly and safely, an animal science technician needed advanced training in calibration, maintenance, and repair of the equipment. This technician trained for three months at the Animal Science laboratories at Virginia Tech. He received hands-on instruction in working with the equipment.

In total, 14 months of technical training were added to the training component of the AED Project using Technical Assistance funds.

3.6 Lessons Learned Concerning Participant Training

Participant Selection:

Question 1: Should the training component have been designed exclusively for the junior faculty, or should refresher courses for senior faculty have been included?

The consensus was that senior faculty members should be included in future training programs. A few PGIA/FA senior faculty spent their sabbatical leaves at consortium universities, thereby allowing them to keep abreast of recent developments in agricultural education.

Question 2: Was participant selection thorough enough?

Participants were selected by University of Peradeniya officials, USAID/Sri Lanka, and the contractor's representative in the field. The active involvement of the institutions mentioned above resulted in the selection of academically excellent participants. Problems that ensued once the project was underway could not be foreseen at the time of selection, nor how the unrest in Sri Lanka following the 1983 riots was going to affect the participants already in training in the United States.

Training Program:

Question 1: Was training too long, and did participants sever ties with their own country and become too 'Americanized'?

The objective of the project was to train the existing PGIA/FA staff at the Ph.D. level. The majority (26) needed double degrees, which accounted for more than five years' training in the United States. This was the only way to fulfill this institution-building requirement using the staff already at the PGIA/FA. It was anticipated at the time of project design that training of five to six years would have adverse effects on some of the participants but there was no alternative, based on the reason stated above.

Although training was long, most participants conducted research in Sri Lanka for as long as two years. This in-country research served to bring participants back in touch with the reality of their own country. USAID/Sri Lanka saw the "Americanization" of the participants from two perspectives: on one hand it was seen as a positive outcome in that it strengthened ties between the two countries. On the other hand, in addition to becoming accustomed to better classroom and research facilities and resources, adverse effects to long-term training included opportunities to identify and qualify for openings in the international job market. USAID/Sri Lanka also felt that discontent of dependents moving back to Sri Lanka was a negative factor. For example, children of participants were being educated in English for years and had a limited capacity in their mother language. They had difficulty in adjusting to the educational system in Sri Lanka as courses are taught in Sinhalese and Tamil, for the most part, in the primary and secondary schools.

Question 2: Did participants take too long to analyze their data, write their dissertations, and defend them?

Assessment of participant progress in data analysis and dissertation writing is based on reports from the participant and the advisor. Once coursework is finished, it is difficult to measure progress or lack thereof, as many variables affect outcome -- that is, seeds sprouting/or not, computer malfunction, incorrect or inadequate data input, and so forth.

Question 3: How can one develop realistic expectations about when a participant should finish his/her graduate program?

It is useful in planning to set guidelines based on the average time for a participant to complete training, but it must be recognized that some students will finish several months earlier and others will finish several months later than the average. Predicting the length of time a piece of research takes is not an exact science.

Spouses and Families:

Question 1: Were families in the U.S. an added burden to participants?

In general, they were an asset. Participants were able to concentrate on their studies better when they did not have to worry about their families' well-being back home. Some spouses were granted permission by the INS to hold part-time jobs. Others were given financial support by the universities to pursue graduate studies.

Question 2: Will participants learn English better if family is not with them when they first arrive in the United States?

In the case of participants who had problems with the English language, it was felt that having their families along isolated them from making contact with Americans and the English language. Consensus was split on this issue, some recommending that in future programs dependents be allowed to join participants after they have completed their first year of training. On the other hand, it was pointed out that participants without dependents generally room together and do not speak English among themselves as a rule.

Other Issues:

Question 1: Is there a way of making the processing of requests for leave extensions less involved and cumbersome?

Although on several occasions participants requested leave for the necessary period of time that would allow them to complete a certain portion of their training, the PGIA/FA and USAID/Sri Lanka gave only partial approval, thereby requiring that the participant, advisor, and campus coordinator write several times requesting the same leave. The process should be streamlined to allow for better handling of these requests.

Question 2: How does Sri Lanka benefit by having participants conduct thesis research in-country?

The conclusion of the Campus Coordinators of the three consortium universities is that, except in special circumstances, it is better for participants in AID-sponsored training programs to conduct thesis research in their home country. This plan is preferable for two reasons:

- It helps to ensure that research will be conducted on problems of high priority to the country. Researchers later in their careers tend to continue pursuing the same type of research they earlier conducted for their dissertations. High priority topics are thus reinforced for continuing research.
- Scientists need to demonstrate to themselves and others that relevant and good research can be conducted in their own academic environment in the absence of excellent equipment and good support systems that may be available in U.S. universities.

Question 3: How can the University of Peradeniya retain senior faculty at the PGIA/FA in the future?

Sri Lanka is surrounded by countries that have well-known and successful agricultural research centers, among them the Philippines, Thailand, and Taiwan. These centers pay higher salaries and provide excellent conditions for research in tropical agriculture. It was recommended that the University increase salaries and offer adequate faculty housing and other benefits to retain its present staff. Research equipment should be maintained adequately and updated periodically to ensure that high quality research can continue to be conducted at the PGIA/FA.

Question 4: Was the short-term technical assistance component adequately designed?

Overall, short-term technical assistance was adequate and contributed enormously to the growth of the PGIA/FA (see section 4.0 Technical Assistance). USAID/Sri Lanka and PGIA/FA officials, however, felt that some of the assignments were too short to be effective. Although the intent was for short-term assignments to be for three or four months, few fulfilled this requirement. That U.S. staff were unable to accept longer assignments while U.S. universities were in session they felt was understandable but not consistent with project design. The consensus was that this component could have been better designed, taking into account the reality of the need and the availability of resources.

Question 5: How do periodic evaluations help in the implementation of a project?

Throughout the life of this project, participating institutions had the flexibility to accommodate new demands or expectations as they arose. An evaluation of the project was carried out midway into its implementation, and several recommendations were later put into effect. Problems associated with in-country research provide an example. The PGIA/FA and the Chief-of-Party streamlined activities so that the participant received the logistics, transportation, and facilities support needed to allow him/her to maximize the time spent in Sri Lanka. In addition, the in-country advisor was identified and nominated well in advance of the participant's arrival. This approach allowed for closer identification and guidance according to departmental needs in various research areas.

On several occasions, Consortium Council members requested evaluations while the project was underway. This would have allowed for changes and adjustments, such as the one mentioned above. Unfortunately no other interim evaluation was planned for the project. USAID/Sri Lanka agreed that additional evaluations, especially earlier into implementation, would have been useful in making adjustments in various areas of project implementation. Areas mentioned dealt with the system used in monitoring participant progress and the review and approval of requests for extension. A final evaluation was scheduled to take place within six months of project completion.

4.0 TECHNICAL ASSISTANCE

4.1 Rationale and Objectives

The contract called for 226 person-months (p.ms.) of short- and long-term technical assistance in specific fields, and nine person-months of unspecified assistance to help in the implementation of the AED Project. Four of these person-months were allocated to a Space Planning Specialist, who made the preliminary assessment and recommendations for expansion of PGIA/FA facilities. (See Section 7.3, Facilities Planning and Development.) The remaining 222 p.ms. were divided among the fields of Agricultural Economics (52 p.ms.), Crop Science (24 p.ms.), Agricultural Biology (39 p.ms.), Agricultural Chemistry (39 p.ms.), Animal Science (25 p.ms.), Agricultural Engineering (19 p.ms.), and Farm Management (24 p.ms.). The total technical assistance to be provided was increased in October 1982 to 237.90 p.ms.

The main purpose for the technical assistance was to help with the teaching and research responsibilities at the PGIA/FA which would be short of staff while participants were training in the United States. Technical assistance was essential for the PGIA/FA to increase enrollments and, thereby, graduates, as was mandated by the Government. The level of effort for each consultant to the PGIA/FA was to be three to four months, and the technical assistance would be provided through the U.S. consortium universities and the Academy.

Technical assistance personnel would assist with the following activities:

- Curriculum development and course content preparation.
- Assistance to PGIA/FA in research planning, development, and coordination.
- Delivery of seminars and lectures.
- Recommendations of publications in their fields of expertise for the PGIA library acquisitions list.

The total long- and short-term technical assistance provided from 1979 to 1986 by the AED Project to the PGIA/FA amounted to 240.47 p.ms. - three person-months over that projected in 1982.

4.2 Long-term Technical Assistance

Critical areas were identified in which the PGIA/FA lacked or had limited expertise and for which long-term consultants would be required. These areas were Rural Sociology, Plant Breeding, Experimental Farm Development, Agroclimatology, and Soil Physics. These assignments were modified in the Plan of Implementation (P.I.) and later again in 1982, as follows:

Projected Person-months of Technical Assistance

	Original Contract	1980 P.I.	1982 Projections
Rural Sociology	27	24	25
Plant Breeding	27	24	29
Farm Management	24	15	12.5
Agroclimatology	12	12	3
Soil Physics	21	15	10.5

Between 1979 and 1981, approximately 42 p.ms. of technical assistance were provided to the PGIA/FA. This represented a drop of about 10 p.ms. from the level projected for 1980 and of 21 p.ms. from the level projected for 1981.

The major factors which contributed to this decrease was continuing uncertainty as to whether or not the additional funds required to implement the P.I. in its entirety would be authorized by USAID/Sri Lanka, as cost projections varied from those originally specified in the contract. This made it necessary to restrict technical assistance assignments to those of highest priority. It was anticipated that other assignments projected for 1981 would be rescheduled later in the project, depending on the availability of resources. These issues were later resolved, and the balance of the technical assistance contracted was provided by short-term advisors in the fields requested.

The AED Project delivered 67 p.ms. of long-term technical assistance (not including the Chief-of-Party position - 81 p.ms.), as follows:

Actual Person-months of Technical Assistance

Rural Sociology	25
Plant Breeding	29
Farm Management	13

Technical assistance in Agroclimatology and Farm Management was provided by short-term consultants.

The other long-term assignment combined administrative and technical assistance responsibilities and was vested in the AED Project Chief-of-Party. The Chief-of-Party served as liaison between the PGIA/FA, USAID/Sri Lanka, and the AED Project Office in Washington, D.C. The technical assistance portion of his assignment, although charged to administration, was geared to the development of the PGIA/FA outreach and extension capabilities. Two Chiefs-of-Party served in Sri Lanka: the first from mid-1979 to December 1982, and the second from that date to December 1985, for a total of 81 person-months. (See Section 7.7, Outreach, and Section 8.0 Project Administration.)

Outreach activities were seriously hampered by a lack of adequate facilities and equipment at the PGIA/FA at the beginning of the project. Activity in this area picked up as the equipment arrived and was installed. The print shop was set up in 1982 by an offset printing specialist hired by the AED Project for this purpose. The Instructional Media Unit was designed and set up by the Chief-of-Party in 1985 upon receipt of the audiovisual equipment. (See Section 7.4, Facilities Planning and Develop-

ment.) He also trained the PGIA technician in charge of its operation. This technician later traveled to one of the consortium universities for further training. (See Section 3.5, Short-term Technical Training.) Videotapes and print material were produced for PGIA extension programs. Both Chiefs-of-Party gave instruction in extension and communication techniques to PGIA/FA students and interested staff.

4.3 Short-term Technical Assistance

Short-term technical assistance was designed primarily to provide guidance to participants in their in-country dissertation research. The participant's major advisor generally served in this capacity. While in Sri Lanka, the advisor was also expected to teach courses, help with curriculum development, give seminars and lectures, and provide the library with a list of recommended books and journals in his/her field.

The PGIA/FA expected the short-term assignments to last three to four months each. Instead, some assignments were reduced to one month and some even to two weeks. The main reason for the shortened length of assignment was that the advisors were full-time pro-

fessors at the U.S. universities, with teaching and research engagements during the academic year. The only time when they were available for longer than a one-month assignment was during the summer months, when the PGIA/FA had no classes scheduled. The best arrangement was an eventual compromise that allowed high-quality consultants to go for shorter periods of time to the PGIA/FA during the academic year.

During 1985 and 1986, the PGIA/FA identified fields in which technical assistance was needed but not related to participant research activities. In 1985, the AED Project provided 6.5 p.ms. of additional technical assistance in the fields of Equipment Maintenance and Calibration (4.0 p.ms.), Plant Tissue Culture (1.5 p.ms.), and English Language and Technical Writing (1.0 p.ms.). In 1986, experts in Aquaculture and Inland Fisheries (3.0 p.ms.), Farm Mechanization and Post-Harvest Technology (2.0 p.ms.), Meat Processing (1.5 p.ms.), and Agrometeorology (.25 p.ms.) provided short-term assistance to the PGIA/FA.

Short- and long-term advisors submitted End-of-Tour Reports at the conclusion of their assignments, giving the scope of work, accomplishments, and recommendations. These reports are on file at the PGIA library.

The total short-term technical assistance provided by the AED Project amounted to 92.47 p.ms.

Table I
Technical Assistance Provided by Year

Year	Name	Field	Person-Months
1979	R. Pienkowski	Entomology	1.50
	R. Blaser	Agrostology	1.50
	E. Collins	Waste Management	1.50
	W. Downs	Farm Management	4.50
	F. Gwazdauskas	Environmental Physiology	2.00
	C. Harston	Marketing	2.50
	E. Kornegay	Monogastric Nutrition	1.00
	M. Kosztarab	Entomology	1.50
	T. Marlowe	Animal Breeding	1.50
	H. Miller	Facilities Planning	1.50
	H. Ray	In Home Office	3.00
	H. Ray	Chief-of-Party/Outreach	9.00
	(1979) Subtotal		31.00
1980	M. Tedrich	Agricultural Economics and Extension	1.00
	J. Boyle	Virology	2.50
	H. Deegan	Rural Sociology	12.00
	W. Downs	Farm Management	8.50
	A. Erickson	Soil Physics	3.00
	J. Fontenot	Ruminant Nutrition	1.00
	J. Halcomb	Agricultural Education	3.00
	O. Hatley	Cropping Systems	3.00
	C. Haugh	Agricultural Engineering Administration	1.00
	P. Lineback	Food Science	1.00
	V. Micuda	Library Science	1.00
	H. Miller	Facilities Planning	2.00
	J. Perumpral	Farm Power and Tillage	1.00
	H. Ray	Chief-of-Party/Outreach	12.00
	J. Starling	Crop Science Administration	1.00
H. Miller and L. Thornton	In Home Office	0.60	
	(1980) Subtotal		53.60

Table I (continued)
Technical Assistance Provided by Year (continued)

Year	Name	Field	Person-Months
1981	H. Deegan	Rural Sociology	12.00
	F. Gilstrap	Entomology	1.00
	N. Hartwig	Weed Science	2.00
	A. Omran	Plant Breeding	10.00
	J. Palmer	Food Science	3.00
	H. Ray	Chief-of-Party/Outreach	12.00
	J. Wiersma	Soil and Water Management	3.00
		(1981) Subtotal	43.00
1982	H. Deegan	Rural Sociology	1.00
	R. Engman	Print Communication	3.00
	P. Kirshen	Water Management	1.00
	J. MacNeil	Food Science	2.00
	S. Martin	Chief-of-Party/Outreach	1.00
	A. Omran	Plant Breeding	12.00
	H. Ray	Chief-of-Party/Outreach	11.00
	H. Ray	Senior Project Advisor	1.00
	M. McCord and K. Mason	In Home Office	0.22
	(1982) Subtotal	32.22	
1983	V. Allen	Pasture Management	1.25
	J. Fontenot	Ruminant Nutrition	.75
	P. Kirshen	Water Management	.25
	E. Kornegay	Monogastric Nutrition	.50
	S. Martin	Chief-of-Party/Outreach	12.00
	A. Omran	Plant Breeding	7.00
	H. Ray	Senior Project Advisor	.75
	R. Shumway	Production Economics	.75
	S. Willatt	Soil Physics	3.00
		(1983) Subtotal	26.25
1984	E. Collins	Waste Management	1.00
	F. Gwazdauskas	Environmental Physiology	.40
	R. Hutnik	Forest Ecology	.75
	E. Kornegay	Monogastric Nutrition	.25
	T. Marlowe	Animal Breeding	1.25
	S. Martin	Chief-of-Party/Outreach	12.00
	J. Nieber	Soil and Water Conservation	1.00
	A. Omran	Plant Breeding	.75
	H. Ray	Senior Project Advisor	.50
	C. Sachs	Rural Sociology	1.00
	J. Shannon	Crop Physiology	1.00
	E. Yoder	Agricultural Education	1.00
	(1984) Subtotal	20.90	
1985	J. Balogh	Technician Training/Equipment Maintenance	2.00
	D. Bessler	Agricultural Economics	.75
	J. Bollag	Soil Microbiology	.75
	T. Collins	Technician Training/Equipment Maintenance	2.00
	C. Haramaki	Tissue Culture	1.50
	J. Kelly	Post-Harvest Physiology	.75
	D. Knievel	Stress Physiology	1.00
	R. Kramer	Agro-Business	.75
	W. LePort	Farm Machinery	.75
	S. Martin	Chief-of-Party/Outreach	12.00
	M. McCord	Academic English/Technical Writing	1.00
	G. McKee	Seed Physiology	1.00
	D. Reed	Post-Harvest Physiology	.75
R. Tabor	Legume Breeding	.25	
	(1985) Subtotal	25.25	

Table I (continued)
Technical Assistance Provided by Year (continued)

Year	Name	Field	Person-Months
1986	L. Helfrich	Inland Fisheries	3.00
	J. Perumpral	Farm Mechanization	2.00
	R. Kelly	Meat Processing	1.50
	J. Griffiths	Ag. Meteorology	.25
	S. Martin	Project Advisor	1.50
		(1986) Subtotal	8.25
		GRAND TOTAL	240.47 p.ms.

5.0 LIBRARY DEVELOPMENT

5.1 Books and Microfiche

In 1980 the PGIA and the Faculty of Agriculture agreed to integrate their libraries into a single library to be housed temporarily in the PGIA building. Although construction of new library facilities was planned to begin during project implementation, only recently were funds allocated for this purpose, and construction expected to begin during 1986.

In 1980 Penn State sent a senior librarian from its Life Sciences Library for a one-month assignment in Sri Lanka to help organize the PGIA/FA library and provide technical advice on library management. This assignment was originally scheduled for three p.m.s. With the balance of the funds allocated for this purpose, the PGIA/FA requested that a member of its library staff travel to Penn State for a short-term training course in library management in 1984. This training took place during that year.

The AED Project was contracted to supply the PGIA/FA with 8,000 to 10,000 books and microfiche by the end of the project. To expedite the purchase of the books, the Academy hired The Book House as procurement agent. The books were shipped with other project equipment purchased, thus saving additional freight charges. Books were inventoried and delivered to the PGIA/FA upon arrival. The balance of 770 books and 77 microfiche and film was shipped to Sri Lanka in August 1986 together with the last consignment of equipment procurement. (See Section 6.0, Commodity Procurement.) With this delivery, the total number of books received by the PGIA library in paper and microfiche form is over 10,400--well over the maximum required by contract (see Tables II and III).

Table II
PGIA/FA Library Books
Ordered and Received by Year

Year	Ordered -	Received ±
1979	-0-	25
1980	500	85
1981	750	50
1982	2400	2500
1983	1250	1440
1984	3000	1260
1985	1060	3370
1986	600	700
Total	9,560¹	9,500²

1 - Titles only.

2 - Number of books delivered.

Table III
PGIA/FA Library Books and Journals
Ordered in Microfiche or Microfilm Form
by AED Project

Year	Volumes Ordered	Volumes Delivered	Cost
79-83	-0-	-0-	\$ -0-
1984	875 ¹	-0-	\$ 885.00 ¹
1985	77 ²	875 ¹	\$ 1,690.00 ²
1986	-0-	77 ²	\$ -0-
Total	952	952	\$ 1,575.00

1 Appropriate Technology Library of 875 books in microfiche format.

2 Back issues of Bibliography of Agriculture's Annual Cumulative Index (5 volumes covering 1979-84). Bibliography of Agriculture's Monthly (72 volumes covering 1976-81) in microfilm/microfiche format.

5.2 Journal Subscriptions

The AED Project was committed to supply the PGIA/FA with 60 to 65 periodical subscriptions throughout the life of the project. Beginning in 1984 and continuing through 1986, all publishers of periodicals subscribed to by the AED Project for the PGIA/FA were requested to extend their subscriptions by a minimum of one year and up to 10 years if possible, as requested by PGIA/FA officials and approved by USAID/Sri Lanka and the A.I.D./Washington Contracts Office. The reason for this was to ensure continued journal accessibility after the end of the project in September 1986. From the total of 63 subscriptions, four publishers agreed to 10 years, one agreed to a subscription ending in 1993, three agreed to subscriptions through 1990, three accepted subscriptions through 1989, and 20 agreed to 1988 subscriptions. Twenty-nine subscriptions will expire in 1987. Three publishers have not replied to date to the 1986 request for extension and these subscriptions will expire in December 1986. (See Table IV.)

All periodical subscriptions will continue past PACD, well over the requirements of the contract.

Table IV
PGIA/FA Library Periodicals Obtained
by Date of Subscription Expiration

Title	Exp. Date	Title	Exp. Date
1. Agriculture Engineering	12/88	33. Environmental Entomology	12/87
2. Agronomy Journal	12/87	34. Experimental Mycology	12/87
3. Am. Entomological Soc. Transactions	12/94	35. Extension Review	06/87
4. Am. Journ. of Ag. Econ.	12/87	36. Farm Chemicals	12/87
5. Annual Rev. of Biochemistry	12/88	37. Foreign Agriculture	06/87
6. Annual Rev. of Ecology & Systematics	12/88	38. Genetics	12/87
7. Annual Rev. of Entomology	12/88	39. Human Comm. Res.	12/94
8. Annual Rev. of Genetics	12/88	40. Journ. Ag. & Food Chemistry	12/87
9. Annual Rev. of Immunology	12/88	41. Journ. of Animal Science	12/87
10. Annual Rev. of Microbiology	12/88	42. Journ. of Dairy Science	12/87
11. Annual Rev. of Nutrition	12/88	43. Journ. of Eco. Entomology	12/87
12. Annual Rev. of Physiology	12/88	44. Journ. of Gen. Physiology	12/87
13. Annual Rev. of Phytopathology	12/88	45. Journ. of Heredity	12/90
14. Annual Rev. of Plant Physiology	12/88	46. Journ. of Soil & Water Cons.	12/93
15. Annual Rev. of Sociology	12/88	47. Journ. of Virology	12/87
16. Applied & Envi. Microbiology	12/87	48. Land Economics	12/90
17. Biblio. of Ag. - Monthly	12/89	49. Microbiological Reviews	12/87
18. Biblio. of Ag. - Annual	12/89	50. Mosquito News	12/94
19. Biological Abstracts	12/88	51. Mycologia	12/87
20. Bioi. Abstracts - Index	12/88	52. Nature	12/86
21. Biometrics	12/89	53. Pesticide Biochem. & Physiology	12/87
22. Biotropica	12/94	54. Phytopathology	12/88
23. Cell	12/87	55. Plant Disease	12/88
24. General Chemistry	12/88	56. Publisher's Weekly Record	06/88
25. Crops and Soils	06/88	57. Science	12/87
26. Crop Science	12/87	58. Soil & Water Conservation News	12/87
27. Current Con. - Ag. Bio. & Envir. Sc.	12/90	59. Soil Biology & Biochemistry	12/86
28. Dev. Biology	12/87	60. Soil Science	12/86
29. Ecological Monograph	12/87	61. Soil Sc. Society of Am. Journal	12/87
30. Ecology	12/87	62. Transactions of Am. Soc. of Ag. Engineering	12/88
31. Economic Botany	12/87	63. Weed Science	12/87
32. Entomology Soc. of Am. Annuals	12/87		

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6.0 COMMODITY PROCUREMENT

6.1 Vehicles

The contract specified that the AED Project purchase 10 jeeps. They were purchased and delivered in 1980; also purchased were spare parts for these vehicles. The GSL was to contribute the purchase of buses, mini-buses, trailbikes, pick-up trucks, and a larger truck with the assistance of other donor agencies. This requirement was later dropped through an amendment in 1982.

The 10 jeeps purchased by the AED Project were transferred to the PGIA upon arrival in Sri Lanka. The PGIA, through a letter of understanding, turned four jeeps back to the project for transportation of the visiting professors and for project use. Two of these jeeps were transferred to the PGIA in December 1982, one in December 1985, and the last one in September 1986.

6.2 Equipment

Major equipment procurement activity took place from mid-1980 through 1982 and again in 1985. The original strategy of phasing equipment procurement over several years was abandoned in favor of proceeding as rapidly as possible due to the continuing high rate of inflation. The objective was to have 90% of the equipment funds either spent or obligated before the end of 1982.

Franklin Export Trading Company (FETCO), a purchasing agent, was hired in the United States as a subcontractor to expedite the procurement process. The procurement lists were submitted to FETCO to request bids from suppliers. The bids were analyzed and recommendations made based on the specs submitted. These recommendations were sent to each FA Department for final decision. Once recommendations were agreed to, FETCO ordered the equipment and made arrangements for storage and transportation to Sri Lanka.

The first major consignment arrived in 1981, and two more arrived in 1982. In January 1984 the second round of equipment procurement was purchased and shipped to Sri Lanka.

In late 1983, the AED Project submitted a request to USAID/Sri Lanka to purchase non-U.S. manufactured commodities. Authorization was received in early 1984. Orders were placed, with one shipment arriving in December 1984 and the second in 1985.

During the 1985 Consortium Council meeting, it was agreed that additional equipment could be purchased for the PGIA/FA. The third round of equipment request lists were developed to include replacement parts for broken equipment, spare parts and accessories for existing equipment, components for the tissue culture lab, and a microfiche reader/printer for the library. This list was approved by USAID/Sri Lanka in late 1985. The equipment was purchased in April, and shipped to Sri Lanka in August 1986. It was transferred to the PGIA/FA immediately upon arrival.

In addition to the equipment mentioned above, the contractor was authorized to allow participants to use remaining computer and research funds to purchase personal computers for data analysis associated with their own research. This equipment was in turn to be transferred to the PGIA/FA. (See Annex 4, Final Project Status Report, for complete list.) These computers were shipped to Sri Lanka via air in September 1986.

The total value of equipment purchased by the AED Project for the PGIA/FA is nearly \$900,000 (excluding transportation-associated expenses), exceeding by far the amount initially budgeted for this purpose (see Table V).

6.3 Issues Concerning Procurement

Inadequate specifications: Purchase of several items was delayed because of inadequate specifications received on the procurement lists. Additional information had to be requested from the PGIA/FA Departments for identification and clarification.

Increased cost of equipment: Sometimes procurement lists were drawn from old catalogues. When bids were received, the price quoted was already higher than that originally estimated. In addition to this, bids held the price quoted for a maximum of 90 days. The turn-around time to send the bids to Sri Lanka for review of the specs by each department was usually longer than the 90 days given. As a result, most items turned out to be more expensive at the time of actual purchase than originally anticipated. Inflation also was a contributing factor.

Duty-free entry of equipment: The project was eligible for duty-free entry of equipment as specified in the Project Grant Agreement. The procedure for clearance, however, was long and cumbersome.

Requests for equipment not of U.S. manufacture: Whenever possible, FETCO found alternate equipment manufactured in the United States. When this was not possible, a waiver was requested and received from USAID/Sri Lanka. This request involved audiovisual, rice milling, and photographic equipment.

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Table V
Equipment Costs¹
by Year and PGIA/FA Department

Department	1979-84	1985	1986	Total
Agricultural Biology	\$115,830	\$3,070	\$13,770	\$132,670
Agricultural Chemistry	131,850	85	9,600	141,535
Agricultural Econ./Extension	65,360	12,960	5,940	84,260
Agricultural Engineering	109,645	700	7,565	122,910
Animal Science	106,185	350	10,765	117,300
Crop Science	136,705	770	21,160	158,635
PGIA/FA Library	10,635	-0-	2,980	13,615
Experimental Farms/PGIA	67,000	-0-	3,090	70,090
SUBTOTAL¹	\$743,210	\$22,935	\$74,870	\$841,015
Participant Purchased Equipment				\$45,000
TOTAL EQUIPMENT PURCHASED				\$886,015

¹ All costs are for equipment only and do not include shipping, insurance, or fees.

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7.0 PGIA/FA

HISTORY OF INSTITUTIONAL DEVELOPMENT:

1979 - 1986

The Faculty of Agriculture and the Postgraduate Institute of Agriculture of the University of Peradeniya are the primary sources of university-level agricultural training in Sri Lanka. Since the beginning of the AED Project in 1979, two new faculties of agriculture have opened to offer undergraduate programs (B.Sc.); these faculties at Ruhuna and Batticaloa are much more limited in personnel and facilities at this time than the FA at the University of Peradeniya. The burden of training still rests with the PGIA/FA. Illustrative of its successful development over the course of the AED Project is recognition of the PGIA/FA as a 'center of excellence' for the training of Asian agriculturists by the International Development Research Center (IDRC).

The AED Project addressed the institutional development needs of the PGIA/FA, so that it would be able to fulfill its goal of doubling the number of B.Sc. graduates and tripling the number of M.Sc., M. Phil., and Ph.D. graduates by PACD in 1985. Increasing the number of graduates required expansion and improvement in faculty, facilities, and programs. This section presents data on the growth and development of the PGIA/FA in the following areas:

- Administration
- Academic Staff
- Enrollments
- Facilities Planning and Development
- Academic Programs
- Research
- Outreach

7.1 Administration of the PGIA/FA

The PGIA and the FA operate under separate administrative systems, the PGIA with its own Director and the FA with its own Dean. The AED Project made recommendations on positions and systems needed for the modern administration of an educational institution. New positions specified in the Plan of Implementation included an Assistant Treasurer and Senior Assistant Registrar for the PGIA, and an Assistant Registrar for the FA. A sufficient allotment for clerical assistance already

existed, but competent secretarial assistance was difficult to obtain. The AED Project provided short-term technical assistance in the computerization of student record-keeping and course scheduling. (See Section 3.5, Short-term Technical Assistance.)

Both the PGIA and the FA have experienced difficulties in retaining their administrative staff. In 1984 the FA lost its position of Assistant Registrar, as well as several technical positions. The PGIA's Assistant Treasurer works only part-time at the PGIA; he also has responsibilities at other university units.

7.2 Academic Staff

The Postgraduate Institute and the Faculty of Agriculture share a common faculty. Academic programs are organized into six departments. At the time of the assessment study in 1977, all the departments were seriously understaffed in terms of the scope of the academic programs they offered. The full-time academic staff of the Faculty of Agriculture numbered 34 in 1977 -- 16 on campus and 18 on training leave. Recent B.Sc. graduates, part-time lecturers, and outside teachers were used to teach the full complement of courses, especially at the postgraduate level.

The Five-Year Development Plan of the FA (1977-1992) called for an academic staff of 90, an increase of 56 positions. Significant amounts of training for junior staff numbers were delineated to raise the degree level of instructors from the B.Sc. to the Ph.D. The following table, taken from the 1977 Preliminary Assessment of the PGIA, summarizes the staff development plan prepared by the PGIA/FA.

The AED Project made a major contribution to the development of the PGIA/FA by providing long-term academic training to staff members. Other donor agencies also provided staff training, and new international projects will continue to make training opportunities available for upgrading the quality of PGIA/FA faculty. During the course of the AED Project, visiting professors from the U.S. consortium universities assisted in

Table VI
Staff Development Plan for the PGIA/FA^(a)

ACADEMIC STAFF				
Department	No. on Site	No. on ^(b) Training Leave	No. Requested for Training	Total Staff
Crop Science	3	5	9	17
Agric. Biology	3	3	8	17 ^(c)
Agric. Chemistry	3	2	9	14
Agric. Economics & Extension Animal Husbandry	2	4	7	14 ^(d)
Agric. Engineering	4	2	8	14
	1	2	11	14
Total	16	18	52	90

(a) Based on staff and projections as set forth in Appendix C, Tables 1-6, of the PGIA Preliminary Assessment.

(b) Staff members on training leave in 1977.

(c) Includes two positions vacant and one on local training in 1977.

(d) Includes one unrecruited in 1977.

Table VII
Institutional Source of PGIA Students,
1975 - 1985

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	Total
1. Private	04	04	11	16	16	20	31	22	30	21	22	197
2. Department of Agriculture	03	05	12	08	06	06	14	11	08	03	05	81
3. Department of Education	02	03	09	06		11	03	07	02	02	04	49
4. Department of Animal Production & Health					02	01	06	06	04	02	02	23
5. Department of Minor Export Crops				02		05		01	02	04	02	16
6. Universities	01	02	01	01	03	09	01	13		03	03	37
7. Tea Research Institute		01	03			02				01	01	08
8. Coconut Research Institute				02								02
9. Rubber Research Institute						01						01
10. Sri Lanka Sugar Corporation		01	08	01		01	01		03			15
11. Sugarcane Research Institute								01		01	01	03
12. Mahaweli Authority of Sri Lanka		01					01	01	05	05	07	20
13. Silk and Allied Products Authority			01		01							02
14. Janatha Estate Development Board					01							01
15. Agricultural Diversification Project			01	03								04
16. National Livestock Development Board				01	01	01					01	04
17. Rice Processing Development Centre					01							01
18. Ministry of Coconut Industries					01							01
19. Sri Lanka State Plantation Corporation					01							01
20. Winged Bean Institute										01	02	03
21. Oil and Fats Corporation											01	01
22. Central Bank of Ceylon		01	03			01		01			01	07
23. Agrarian Research and Training Institute										02	02	04
24. Department of Irrigation											03	03
25. Paddy Marketing Board										01		01
26. Natural Aquatic Resources and Energy & Scientific Authority		01				01				01		03
27. Ministry of Rural Industrial Development										01		01
28. Revar Valley Development Board				01	03					01		05
29. State Distilleries Corporation									01			01
30. Sri Lanka Tea Board							01		01			02
31. Ministry of Higher Education								01	01			02
32. Industrial Development Board of Ceylon									01			01
33. Ceylon Fertilizer Corporation								01	01			02
34. Department of Census and Statistics						01						01
35. Agricultural Development Authority						01						01
36. Co-op Development Department							02					02
37. C.W.E.							01	01				02
38. Ministry of Plan Implementation						01	02					03
39. Ministry of Land & Land Development							01					01
40. National Milk Board		01					01					02
41. Food and Agricultural Organization								05				05
42. School of Co-operative								01				01
43. Sri Lanka Air Force								01				01
44. N.A.D.S.A.					02							02
45. Hardy Senior Technical Institute					01							01
46. Department of Buildings					01							01
47. Sri Lanka Cashew Corporation			01		01							02
48. Land Commission				01								01
49. Foreign Students	01		03			01	01		01		03	10
50. National Zoo				01								01
51. Ministry of Home Affairs											01	01
52. Labour Department											01	01
53. Marga Institute											01	01
	11	20	53	43	41	62	65	75	60	49	63	542

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teaching courses, developing curricula, and supervising research. With the return of project trainees to their duties, the PGIA/FA faculty is now able to teach most of its courses itself and supervise the research of postgraduate students.

7.3 Enrollments

The goal of the AED Project was stated in terms of raising PGIA/FA enrollments and graduates. By PACD, the PGIA aimed to enroll 75 new students and graduate 50 postgraduate degree-holders. The FA aimed to enroll 200 new students and graduate 175 B.Sc. degree-holders.

The ability of the PGIA/FA to increase the size of the student body was severely limited by serious shortages in faculty and facilities. Over the course of the project, significant progress was achieved in both of these areas. But enrollment and graduation trends do not yet show steady progress. Both internal and external factors have hampered the ability of the PGIA/FA to proceed smoothly in academic program and campus development.

7.3.1 PGIA Enrollments

Of 542 students enrolled in the PGIA over the past 10 years, the largest single group was made up of private students (197). The remainder of the students came from government departments, ministrics, and Institutes. The PGIA provided training primarily for the Departments of Agriculture and Education (81 and 49 students, respectively); other agencies sent only a few students apiece. (See Table VII.)

In 1979 -- the first year of the AED Project -- the PGIA enrolled 35 new students; in 1985 -- the final year of the project -- 56 new students. Enrollment of new students peaked in 1982 and the number of graduates in 1984. As Tables VIII and IX show, a three-year decline occurred in the percentage of students enrolled compared to those accepted. Prior to 1982, the percentage of students enrolling averaged approximately 75% of those accepted by the PGIA. The 25% attrition rate was attributed to financial difficulties and/or job restrictions.

As the PGIA's capacity increased, it accepted more students, but the number of students actually enrolling decreased. In 1983 the enrollment percentage declined to 66% from the previous year's 82%. In 1984 the enrollment percentage declined to 60%. In 1985 the enrollment percentage declined again to a low of 57% (see Table VIII). In actual enrollment figures, the PGIA admitted 98 students in 1985, the highest number ever accepted; yet only 56% of those 98 students accepted the admission and enrolled for degree programs.

This decline in enrollment could be a problem. The PGIA's capacity to train postgraduate students will increase dramatically in 1986 as all remaining AED Project participants return with their Ph.D. degrees. Two new agricultural development projects will begin in 1986. Two of these projects, the Diversified Agricultural Research Project sponsored by USAID/Sri Lanka and the Sri Lankan Ministry of Agriculture, and the World Bank's Project plan to support approximately 150 M.Phil and 50 Ph.D. students. At least half of these students (including those sponsored by USAID/Sri Lanka: 53 M.Sc. and 5 Ph.D.) will be trained at the PGIA. It is hoped that these two projects will send as many students as possible to the PGIA, so that excellent potential of the newly returned Ph.D. staff and newly expanded research and teaching facilities can be used. If these and other development and research projects do not support the PGIA with scholarship and research funds, the student enrollment could continue to drop as potential PGIA students are sent overseas for training and research.

**Table VIII
PGIA Admissions, Enrollments, and Degrees Granted
1975 - 1985**

Degree	'75	'76	'77	'78	'79	'80	'81	'82	'83	'84	'85	Tot.	Avg.
M.Sc.													
Admitted	21	14	37	28	16	43	32	62	40	29	40	363	33
Enrolled	7	14	28	24	13	35	29	48	26	16	22	262	24
Graduated	0	0	14	27	21	16	13	14	12	25	15	157	17
M.Phil.													
Admitted	0	2	13	11	22	25	40	25	46	51	51	286	29
Enrolled	0	1	9	6	19	21	27	24	31	33	29	200	20
Graduated	0	0	0	0	2	5	9	3	10	18	8	55	8
Ph.D.													
Admitted	8	4	0	4	3	9	3	3	5	4	7	50	5
Enrolled	8	1	0	3	3	5	3	3	3	1	5	35	3
Graduated	0	0	3	1	2	0	3	0	1	3	0	13	1
Total													
Admitted	29	20	50	43	41	77	75	91	91	84	98	699	64
Enrolled	15	16	37	33	35	61	59	75	60	50	56	497	45
Graduated	0	0	17	28	25	21	25	17	23	46	23	225	20

Table IX
Percentage of Enrollment Compared to Admissions in the PGIA,
1975 - 1985

Degree	'75	'76	'77	'78	'79	'80	'81	'82	'83	'84	'85	Avg.
M.Sc.	33%	100%	76%	85%	80%	81%	90%	76%	65%	55%	55%	72%
M.Phil.	0	50	69	54	86	84	68	96	67	65	57	70
Ph.D.	100	25	0	75	100	55	100	100	60	25	71	71

7.3.2 Undergraduate Enrollments

Unlike the PGIA, the Faculty of Agriculture has been able to admit increasing numbers of new students for the undergraduate B.Sc. program. In 1985 a record number of new students enrolled -- 177. It is anticipated that in 1986, 200 will be enrolled after completion of a new dormitory for female students.

In addition to the normal admission of Sri Lankan students, the FA accepted five international students each year in 1983 and 1984. In 1985 that number was tripled to allow 15 foreign students to enter undergraduate training. The students come from Asian coun-

tries and are sponsored by international donor agencies. This increase in international recognition as a center of excellence is a direct result of the PGIA/FA's expansion of their teaching and research capabilities over the past few years.

The scheduling of the undergraduate program was seriously affected by the communal unrest in Sri Lanka since 1983. While the first-year program has begun on schedule each year, the programs for second through fourth year students are each on a different schedule. Despite these disruptions, the numbers of undergraduate students enrolled and graduated have increased over the course of the project (see Table X).

Table X
FA Undergraduate Population by Year,
1975 - 1985

	'75	'76	'77	'78	'79	'80	'81	'82	'83	'84	'85
1st Year	105	110	99	105	112	122	119	130	105	140	177
2nd Year	110	106	110	109	115	112	126	117	130	129	177
3rd Year	102	110	106	110	109	115	113	124	117	116	117
4th Year	48	102	110	106	110	109	114	127	124	119	102
Graduated	47	91	86	104	103	101	109	113	117	120	102

*Not Available

7.4 Facilities Planning and Development

Because of the urgency of facilities planning and development for the expansion of PGIA/FA programs, the first short-term consultant provided by the AED Project was a campus planner. At the start of the project, all the departments suffered from inadequate buildings, facilities, and laboratories. While major plans for construction were drawn up early in the project, serious delays occurred because of uncertainties in financing. Progress in construction is summarized below by department. As with teaching staff, the PGIA and the FA share all facilities.

Completion of a new complex for the *Departments of Agricultural Biology and Chemistry* was delayed from mid-1983 to mid-1986. This delay affected the programs of these departments, as well as the programs of the departments that were to move into the buildings originally used by Biology and Chemistry. Not until the new laboratories are completed can AED Project equipment be fully used.

The facilities of the *Department of Agricultural Economics and Extension* were remodeled to house the PGIA/FA Instructional Media Unit. Construction was completed in 1985. The unit contains a photographic darkroom; audio, video, and graphics studios; a master control room, and offset printing equipment.

The *Department of Agricultural Engineering* was remodeled to accommodate the PGIA Computer Center. The Computer Center was completed in 1984. It will be moved to the office used by the AED Project at the PGIA building after September 1986.

The *Department of Animal Science* developed the Mawela Livestock Field Station; work was completed in 1985. The Department received approval to build a new headquarters for offices and classrooms; construction to begin in 1986.

The *Department of Crop Science* concentrated its efforts on development of the Dodangolla Experimental Farm. This complex became fully operational in 1986 with the completion of office space, workshops, dormitories, and staff housing.

Efforts also have focused on expanding and improving the facilities of the *Maha Illuppallama training complex*. All first year students receive training at this sub-campus. Completion of facilities in 1986 allows the FA to enroll 200 new students for the 1986/87 academic year. New facilities include a student center, library, student hostels, staff housing, and teaching/research units.

Finally, a major priority is the development of the PGIA/FA library. Plans include construction of a new building, computerization of resources, and linking of this library to others in the region for rapid access to information.

7.5 Academic Programs

The Faculty of Agriculture offers four-year undergraduate programs through its six departments. Over the course of the AED Project, the curriculum of each program was reviewed and revised, and new courses were developed with the assistance of the visiting professors from the U.S. consortium universities. Technical assistance recommendations stressed the following points:

- Coordinated approach to course development.
- Decrease in course duplication by departments.
- Emphasis on basic and practical science in first two years and emphasis on specialization in the second two years of the undergraduate program.

In 1985, the FA added several new courses to its curriculum: the Department of Animal Science began teaching Inland Fisheries in 1985-86; the Department of Agricultural Engineering offered Post-Harvest Technology and Irrigation Water Management; the Department of Crop Science introduced a floriculture course; and in 1986 the Department of Agricultural Chemistry offered a series of courses in food science and nutrition. All the new courses have been added to the existing curriculum of the four-year undergraduate program.

The PGIA offers programs at three levels. The M.Sc. program is a 12-15 month program of coursework. The M.Phil. program lasts two years and includes coursework, research and thesis requirement. The Ph.D. program involves coursework, research and dissertation. The PGIA offers about 180 courses through six Boards of Study, equivalent to the Departments of the Faculty of Agriculture. The PGIA focused on developing its master's-level programs during the life of the AED Project. It will increase its Ph.D. program enrollments once the AED Project-trained faculty members have returned to their duties and gained experience.

Section 4.0 on Technical Assistance documented the fields in which the AED Project provided technical assistance through visiting professors. Areas of special need were identified at the beginning of the project and periodically assessed, so that progress in curriculum development would match progress in staff development.

Table XI
Postgraduate Degrees Granted by
Board of Study,
1976 - 1985

Board of Study	DEGREE			Total
	M.Sc.	M.Phil.	Ph.D.	
Agric. Biology	28	23	4	55
Agric. Chemistry	18	5	1	24
Agric. Econ. & Ext.	46	2	2	50
Agric. Engineering	15	7	0	22
Animal Science	30	5	0	35
Crop Science	20	13	6	39
Total	157	55	13	225

7.6 Research

The PGIA/FA staff and postgraduate students are involved in a wide variety of practical and problem-specific research. The sponsoring institutions, both national and international, support research directed toward finding immediate solutions to practical problems. There is no research support for long-term basic research. All research funding comes from outside the university; no core funding is available.

While this practical research orientation is vital to the development of the country and an excellent way for the PGIA/FA to contribute directly to that development, it does not allow for the long-term basic scientific research so essential to the continued growth of an academic 'center of excellence.' Practical research projects are of short duration with the objective being to solve one specific need. Therefore, the research topics are neither complementary nor cumulative; each project answers one independent question. They do not contribute to an overall research strategy or goal.

A systemized prioritization of research topics needs to be established. The PGIA/FA need to define general research areas to which specific research projects can contribute. In this way, all isolated research will be mutually supportive and will culminate in answers to far reaching and major agricultural needs. This does not mean that the practical research projects should be rejected. Rather, they should be selected and developed to fit within the research priorities set by the PGIA/FA. To facilitate this goal-setting and selection process, the AED Project recommended that the PGIA/FA, in cooperation with national and international funding agencies, should:

- Identify subject areas that PGIA/FA are most capable of pursuing.
- Match those capabilities to the long-term agricultural needs of Sri Lanka, Asia, and the Third World in general.
- Set up a research office within the PGIA to coordinate all future research projects.

7.7 Outreach

While there was no institutionalized outreach program at the PGIA/FA until 1985, many staff members contributed individually to the development of other Sri Lankan institutions. Staff members participated with programs of several ministries, including Agriculture, Plantation Industries, Lands, Rural Industrial Development, Finance and Planning, Plan Implementation, Coconut Industries, Mahaweli Development, and on programs of several statutory bodies such as Sugarcane Research Institute, Agrarian Research and Training Institute, Livestock Development Board, among others.

During 1985 some progress toward institutionalizing an outreach program was made, including development of an Instructional Media Unit within the PGIA/FA. The original objective of developing such a unit was to produce extension material aimed at the agricultural community outside the PGIA/FA; a second objective was to produce instructional materials for students within the PGIA/FA. Unfortunately, the organizational and operational systems needed to implement these objectives have not been developed in conjunction with the physical facility. There needs to be an emphasis on developing a management system within the PGIA/FA to plan, implement, and evaluate outreach programs.

The AED Project has recommended that an outreach office be formed and staffed with the responsibility to assist PGIA/FA staff in their outreach activities. With the development of the Media Unit, the physical structure and support system for such an office now exists. At present, all outreach activities performed by PGIA/FA staff are done on an individual basis. An outreach office could help those staff members identify potential outreach programs, produce instructional/extension materials in various media, and manage workshops, seminars, or short courses. Such assistance to the PGIA/FA staff would promote not only dissemination of agricultural information to the non-academic agricultural community, but also would increase the PGIA/FA's visibility in Asia as a "center of excellence."

In response to needs expressed by other organizations, the PGIA has developed two postgraduate diploma programs: Food and Nutrition Policy Planning, recommended by the Ministry of Plan Implementation (ongoing), and Farming Systems recommended by the Ministry of Rural Industrial Development (to commence in October 1987). Both programs have been financed during their initial phases by the FAO.

The PGIA sees itself, also, as the appropriate source of short courses, workshops, and seminars for the Sri Lankan ministries, departments, and institutes involved with agricultural development. The PGIA is committed to strengthening its linkages with these agencies and targetting specific services to their needs. It is exploring ways of expanding the Instructional Media Unit into an Outreach Center with permanent staffing and funding. At the conclusion of the AED Project, the PGIA/FA are in a strong position to undertake further outreach activities for the agricultural community in Sri Lanka and other Asian countries as well.

8.0 PROJECT ADMINISTRATION

8.1 Academy for Educational Development

As prime contractor for the Agricultural Education Development Project, the Academy was responsible for the coordination and administration of project resources. The Academy managed these resources through the AED Project Chief-of-Party, the Consortium Coordinator, and the Academy's Central Services Unit. The Academy also had prime responsibility for equipment and materials procurement and providing certain of the specialized short-term technical assistance, including facilities planning.

Figure 2 depicts the organizational structure of the AED Project, adhered to throughout its implementation.

8.1.1 AED Project Home Office

The Consortium Coordinator worked out of the Academy's Home Office in Washington, D.C., and had the following responsibilities:

- Facilitate the flow of information about such matters as contractual relationships, personnel needs and commitments, finances, and issues of an administrative nature concerning the work of the consortium.
- Coordinate and administer all personnel matters including recruitment, budgeting, accounting, purchasing, training, and project evaluation to fulfill essential functions for project support. Principally responsible for efficient procurement of equipment and library materials.
- Negotiate agreements with A.I.D. and, as appropriate, with the Government of Sri Lanka to ensure smooth project operation.
- Serve as point of liaison and supervision for the AED Project Chief-of-Party based in Sri Lanka.
- Represent the consortium in the U.S. and in Sri Lanka as needed.
- Serve as point of liaison with the three U.S. universities' campus coordinators and with A.I.D.

Dr. John Elmendorf served as Consortium Coordinator from 1979 to early 1980. He was replaced by Mr. William Garvey, who served in this capacity until mid-1981. Ms. Barbara O'Grady served as Consortium Coordinator from June 1981 to December 1983. Dr. Howard E. Ray became Consortium Coordinator during 1984. Mrs. Margarita Driscoll served as Acting Consortium Coordinator from December 1984 to October 1985, when her position was confirmed by the Consortium Council members for the remainder of the Project. Mr. Ricardo Villeta, Vice President

for Administration of the Academy's International Division, provided additional financial expertise to the AED Project from January 1985 to September 1986. The Officer-in-Charge of the AED Project was Mr. Stephen F. Moseley, who served in this capacity from the inception of the AED Project to its conclusion.

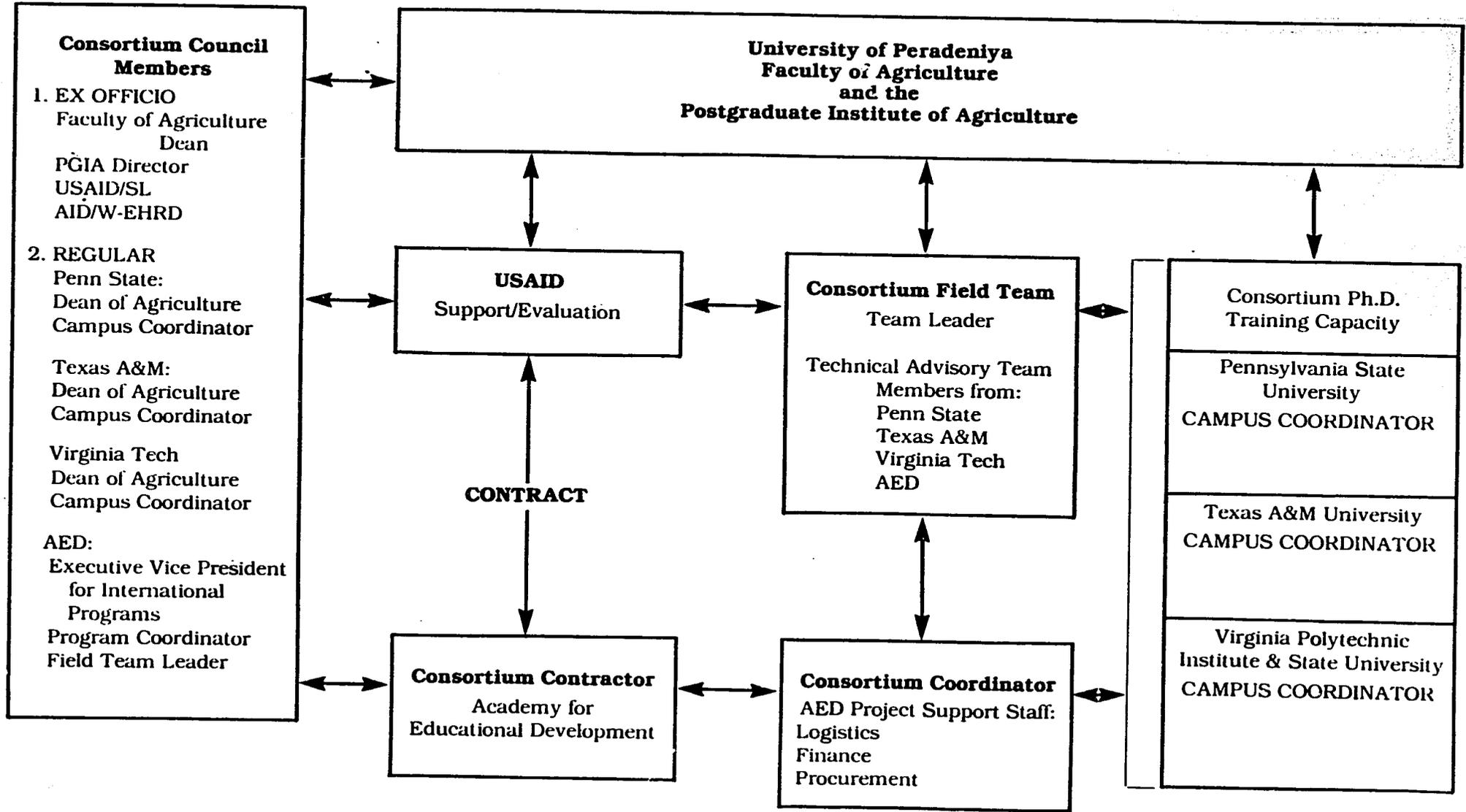
8.1.2 AED Project Field Office

The AED Project Field Office began operations in July 1979, located in the PGIA building of the University of Peradeniya, Sri Lanka. The consortium representative in the field was the AED Project Chief-of-Party, who had the following responsibilities:

- Administer and coordinate the business and management affairs of the consortium and provide liaison among the U.S. advisors, the University of Peradeniya, the PGIA/FA, and USAID/Sri Lanka.
- Provide appropriate administrative support for consortium members in Sri Lanka.
- Communicate with the Consortium Coordinator in the Academy's Home Office about progress in the program and about administrative and management issues affecting project implementation.
- Provide liaison on a continuous basis with appropriate PGIA/FA officials and USAID/Sri Lanka with respect to detailed implementation plans for the AED Project.
- Coordinate all inputs from the consortium in the field, including advisory personnel, equipment, materials, and oversee participant selection and research activities of Ph.D. candidates in Sri Lanka.
- Review project activities on a continuous basis to assure adherence to the project time schedule and adequacy of performance in meeting project goals and objectives.
- Make adjustments or modifications within the limits of contract authorization and approved budget, as necessary, and in consultation with the Consortium Coordinator.
- In cooperation with PGIA/FA officials, assist in the direction and supervision of project operations, particularly in the performance of contractor personnel assigned to the project.

Two Academy staff members served as AED Project Chiefs-of-Party throughout its implementation. Besides their administrative functions, they also served as technical advisors in Extension and Outreach activities at the PGIA. Their contributions in this area are discussed in Section 4.2, Long-term Technical Assistance.

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



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Dr. Howard E. Ray served as AED Project Chief-of-Party from June 1979 to December 1982. As the first Chief-of-Party, he was responsible for organizing the field office, hiring and training local staff in administrative matters and office procedures. Dr. Ray designed a procurement tracking system that included relevant information from the moment the equipment was requested to its purchase and actual transfer to the PGIA/FA. He also designed and implemented an accurate and efficient accounting system to record AED Project expenses in the field. These systems were adhered to throughout the AED Project. Dr. Ray also served as Senior Project Advisor from January to December 1983, when he became Consortium Coordinator.

Mr. Stephen T. Martin replaced Dr. Ray in December 1982 and served as AED Project Chief-of-Party until December 1985. Mr. Martin continued to carry out administrative duties in the field and also designed and set up the Instructional Media Unit at the PGIA, as described in Section 4.2. Long-term Technical Assistance.

Mrs. Margarita Driscoll, Consortium Coordinator, assumed the administrative responsibilities of the field office upon Mr. Martin's departure from Sri Lanka. She was assisted in this endeavor by Miss Shyamalie Dissenayake, AED Project Administrative Assistant, who worked on a part-time basis from January to September 1986.

Mrs. Driscoll and Mr. Villeta traveled to Sri Lanka in June 1986 to conclude field operations and make final title transfers of equipment and vehicles to the PGIA/FA.

The Campus Coordinators and the Deans of the Colleges of Agriculture from the consortium universities were members of the Consortium Council (see Section 8.4). They actively promoted the linkages concept and drafted the Memorandum of Understanding and Implementing Strategy (see Section 9.0. Linkages) that provide opportunities for the U.S. universities and the PGIA/FA to continue to collaborate in research and other activities after completion of the project.

In 1979, the Deans of the Colleges of Agriculture at the consortium universities were Dr. James Nichols, Virginia Tech; Dr. H.O. Kunkel, Texas A&M, and Dr. Samuel Smith, Penn State. Dr. Smith was replaced in 1985 by Dr. Wayne Hinrich as Acting Dean; the present Dean of the College of Agriculture at Penn State is Dr. Lamartine F. Hood. Dr. Nichols and Dr. Kunkel served as Council members throughout the life of the project.

The Campus Coordinators selected in 1979 for the AED Project were Dr. P. Howard Massey, Virginia Tech; Dr. Robert H. McAlexander, Penn State; and Dr. E.P. Creech, Texas A&M. Dr. Massey served as Virginia Tech's Campus Coordinator throughout the life of the project. Dr. J. Dean Jansma replaced Dr. McAlexander upon his retirement in January 1984; Dr. Jansma served as Penn State's Campus Coordinator until September 1986. Dr. Creech was replaced by Dr. Morris Bloodworth in 1981; he served as Texas A&M's Campus Coordinator until 1984 when he retired. Dr. James Goodwin then served in this position from September 1984 to September 1986.

Project Administrators were Mrs. Peggy Hall, Virginia Tech (1979-1986); Mrs. Judy McCormick, Penn State (1979-1986); and Dr. Edna Koenig (1980-1984) and Mrs. Violetta Cook (1984-1986) at Texas A&M.

8.2 Consortium Universities

The Academy entered into subcontractual arrangements with three U.S. universities, each taking the lead in specific areas. They were:

- **The Pennsylvania State University** for Crop Science, Agricultural Chemistry, & Library Science.
- **Texas A&M University** for Agricultural Biology and Agricultural Economics and Extension
- **Virginia Polytechnic Institute and State University** for Animal Science and Agricultural Engineering.

These three universities each agreed to arrange for technical assistance, provide Ph.D. candidate training, assist in the selection of equipment to be procured, and develop recommendations for library acquisitions in their specific field. As discussed in Section 2.4. Consortium Contributions beyond Contract, the U.S. universities did not limit their assistance to the formal provisions outlined above. (See Annexes 1, 2, and 3, for complete Final Reports from each consortium university.)

Campus Coordinators and Project Administrators from each university were selected to oversee the implementation of training and technical assistance. They evaluated each participant's transcript, processed enrollment, and made arrangements for housing. They monitored student progress on a day-to-day basis, provided logistical support for annual campus visits by the Consortium Coordinator and the Chief-of-Party, and compiled financial information for the subcontract.

8.3 PGIA/FA

The PGIA Director and FA Dean played key roles as Director and Co-Director of the AED Project. Their direct participation in the planning of every component of this project ensured that it adhered to PGIA/FA priorities. As officials of the University of Peradeniya, they facilitated contact with government officials in the Ministries of Higher Education and of External Resources, and they served as conduits to the University Grants Commission on all project matters. The Director and Co-Director worked closely with the Chief-of-Party in developing and implementing project activities concerning participant selection and training plans, equipment procurement, library development, and selection of all technical assistance to this project.

The Director and Co-Director collaborated in preparation of the Quarterly and Annual Project Reports that were submitted to USAID/Sri Lanka and distributed among the consortium members. The PGIA and FA's Annual Reports were included in their entirety in every Annual Report.

The Director and Co-Director were members of the Consortium Council and attended all scheduled meetings. They served as hosts when these meetings took place in Sri Lanka and traveled at project expense to the U.S. meetings. In conjunction with Consortium Council meetings, the Director and Co-Director traveled to each of the three U.S. universities in the company of the Chief-of-Party and Consortium Coordinator. The participants welcomed these visits, which allowed them to get news from Sri Lanka and to discuss progress in their training.

The Director and Co-Director encouraged the development of post-project activities, ensuring the attention of government officials responsible for agricultural education in Sri Lanka, as well as the consortium universities. The success of the Agricultural Education Workshop on Linkages is much to their credit. This special meeting of the Consortium Council took place in Sri Lanka in June 1986 at the request of the Director and Co-Director. At this meeting, a Memorandum of Understanding (see Annex 7) between the PGIA/FA and the Consortium universities was signed, and a plan of implementation elaborated on specific activities to be undertaken collaboratively after PACD.

Prof. T. Jogaratnam, PGIA Director, served as Director of the AED Project from its inception until mid-1981, when he spent one year of sabbatical leave at Virginia Tech. He resumed directorship upon his return to Sri Lanka in September 1982 and served until December 1985, when he left on leave for an assignment with the World Bank in Nigeria.

Prof. Y.D.A. Senanayake, FA Dean, served as Co-Director from 1979 to June 1982, when he went to Pennsylvania State University and Texas A&M on sabbatical leave until September 1983. He was named PGIA Director to succeed Prof. Jogaratnam in February 1986, when he also assumed the directorship of the AED Project.

Prof. H.P.M. Gunasena replaced Prof. Senanayake as FA Dean in July 1982, at which time he was made Co-Director of the AED Project. He also served as AED Project Co-Director during 1982. Prof. Thenabadu served as Acting PGIA Director and Acting Director of the project during the academic year 1981-82 while Prof. Jogaratnam was on sabbatical leave at Virginia Tech. Prof. Senanayake and Gunasena served as the main contact between the AED Project Home Office and USAID/Sri Lanka in the absence of a Chief-of-Party during 1986.

8.4 Consortium Council

The Consortium Council's responsibilities and functions were:

- To determine overall policies and procedures for conducting the work of the various institutions involved in project implementation, and for relating the functions performed by the consortium to the stated objectives of the AED Project.
- To evaluate periodically the progress of the consortium, including the role of the consortium member institutions.
- To select and approve the Consortium Coordinator at the Academy's Home Office and the AED Project Chief-of-Party

Members of the Consortium Council included USAID/Sri Lanka officials; PGIA/FA representatives; Deans of Colleges of Agriculture and Campus Coordinators from the three consortium universities; the Consortium Chief-of-Party, and the Consortium Coordinator. The Council annually selected a chairman and vice-chairman from among the consortium members. The meetings took place alternately in the United States and Sri Lanka, with the exception of 1983 because of internal disturbances in Sri Lanka that year.

Two special meetings took place in 1986 to address specific areas of concern of the Consortium Council. The first one, in April 1986, included the Campus Coordinators and Project Administrators from each university, the Consortium Coordinator, and the Academy's Vice President for Administration. The decision to hold this meeting was made during the October 1985 Consortium Council meeting to clarify and confirm the participants' completion schedules. The Council also sought recommendations on ways to deal with participants who would be unable to complete by PACD. A special report was submitted in May to USAID/Sri Lanka and PGIA/FA officials addressing these issues. Final subcontractual obligations at each consortium university were defined during this meeting as well.

The second special meeting took place in June 1986 in Sri Lanka and dealt with project activities past PACD.

8.5 USAID/Sri Lanka

The USAID Project Manager's role was primarily that of monitor and facilitator. Monthly project meetings allowed for periodic visits to the University of Peradeniya for updates on project matters and first-hand experience with its development. Quarterly, Annual, and Special Reports, as well as End-of-Tour Reports by visiting staff, were submitted to the USAID Project Manager.

The USAID Project Manager was instrumental in expediting issues concerning action to be taken by Government of Sri Lanka officials, such as with duty-free entry of equipment purchased under the project. He also facilitated the processing of the students' Plan of Implementation Order/Participant (PIO/P) forms, visa applications, and travel to the U.S. universities.

The USAID Project Manager gave support and guidance on all project matters which were brought to his attention. He was an honorary member of the Consortium Council and was invited to attend the annual Consortium Council meetings. On several occasions, the USAID Project Manager or his representative made campus visits with the AED Project Chief-of-Party and Consortium Coordinator to meet personally with the participants to discuss progress in their training.

Mr. Charles Antholt, USAID/Sri Lanka Agricultural Development Officer, served as the first USAID Project Manager until early 1980. He was replaced by Mr. Thomas Wilson, who served until August 1980, when Dr. James Bonner, Assistant Agricultural Development Officer, took over the position. Mr. Bonner remained in this position until early 1985 when he left Sri Lanka for a new assignment in Africa. Mrs. Sithy Thaha became the USAID Project Manager upon Dr. Bonner's departure and served in this capacity until September 1986.

9.0 LINKAGES

9.1 Development of Linkages

During the last two years of project implementation, members of the consortium and PGIA/FA officials gave much thought to how the relationship developed over the life of the project could be institutionalized. Linkages, it was felt, should be structured to strengthen instruction, research, and extension in the fields of agriculture and related areas.

At the April 1984 Consortium Council Meeting held in Sri Lanka, a committee was appointed to identify areas in which linkages could be developed and to define a plan of action. In addition to the committee's work, the Chief-of-Party submitted a report in July 1985 to USAID/Colombo offering recommendations for project follow-up activities in four areas: research, technical assistance, publications, and seminars.

At the October 1985 meeting of the Consortium Council, the Dean of the Faculty of Agriculture and the Director of the PGIA strongly urged the Council to act on the following recommendations for action that would strengthen collaboration and linkages between the Consortium and the PGIA/FA:

- Continued contact between participants and their U.S. advisors after return to Sri Lanka.
- Include the PGIA/FA in new projects and programs or identify possibilities for collaboration in existing ones.
- Immediately after PACD, hold a three- to six-month management seminar for all returned participants to enable them to better carry out administrative duties at the research stations, farms, and so forth.
- Design collaborative research to be carried out through the exchange of faculty between the consortium universities and the PGIA
- Investigate the possibility of sponsoring PGIA staff attendance at professional seminars and conferences.
- Design one-year exchange programs for PGIA students to attend U.S. universities as part of their degree programs at the University of Peradeniya. The U.S. advisors of PGIA students would be invited to Sri Lanka to be part of their committees and to participate in research and teaching activities.
- Help to identify funding sources for research development at the PGIA, such as USDA, World Bank, etc.

The linkages concept was placed on the agenda for the Campus Coordinators' meeting held in April 1986. Those present at this meeting stressed the importance of producing a tangible agreement before the end of the project, and recommended that such an agreement take the form of a Memorandum of Understanding. This Memorandum became the basis of discussion at the final project meeting held in Sri Lanka in June 1986.

9.2 Memorandum of Understanding

In April 1986, AED Project Campus Coordinators brought for review samples of memoranda of understanding that their universities had with other international institutions. The Chairman for the forthcoming linkages meeting, Dr. H.O. Kunkel, Dean of the College of Agriculture at Texas A&M; Dr. P. Howard Massey, Director of International Development at Virginia Tech; Dr. J. Dean Jansma, Director of International Agricultural Programs at Penn State; and Mrs. Margarita Driscoll, Home Office Coordinator, drafted the Memorandum of Understanding between the consortium universities and the PGIA/FA, which was then circulated among the Council members before a final version was sent to Sri Lanka.

The final draft was submitted to the Director of the PGIA, the Dean of the Faculty of Agriculture, and USAID/Sri Lanka for comments. The Memorandum was well received by the officials, and a date was set for the U.S. Council members to travel to Sri Lanka for final discussion and signature of the document. The Agricultural Education Workshop on Linkages took place in Kandy from June 2 - 6, 1986, and the Memorandum was signed during the closing ceremonies. (See Annex 7, Memorandum of Understanding and Implementing Strategy.)

9.3 Implementation Strategy for Linkage Activities after PACD

Representatives of the Consortium also drafted an additional document (Annex 7) which provided the implementation strategy for the Memorandum of Understanding. Reviewed and approved by the Director of the PGIA and the Dean of the Faculty of Agriculture, this document includes activities for:

- Joint Research
- Staff Training
- Curriculum Review
- Short-term Technical Assistance
- Reciprocal Educational Exchange Programs
- Library Development
- Computer Facilities
- Short-term Courses
- Conferences and Professional Seminars
- Continued communication among the various institutions.

Three caveats were made: the nature of the implementation strategy is tentative and requires acceptance by all participating institutions; individual implementation orders would be negotiated and signed by the PGIA/FA and one or all of the Consortium members before there is a significant commitment of funding to a specific linkage activity; the implementation strategy is neither inclusive of all activities nor exclusive of activities that may be devised.

For the Memorandum of Understanding to work effectively, it would be necessary to undertake proposal writing to donor agencies in Sri Lanka and the United States. Areas of interest would have to be identified for the activities described in the strategy document, sources of funding located, and proposals developed.

9.4 PGIA/FA Proposals

The PGIA/FA faculty and staff identified research and other activities in which they would welcome future collaboration with the consortium universities. The proposals stressed the need to maintain the achievements in educational development brought about through the project, especially in the areas of staff and curriculum development. The FA proposal included specific recommendations for staff and student exchange programs, so that a two-way flow of information and expertise would be continued. In terms of strengthening course development, curriculum revision, and modernization of teaching methods, the FA recommended the creation of a special Agricultural Education Unit. This Unit would coordinate and implement technical training activities in agriculture between the various ministries and governmental institutions in Sri Lanka. Also mentioned was the need to continue laboratory, library, and capital development programs.

The FA also submitted a proposal addressing the needs of the Maha Illuppallama Subcampus, a center located in the dry zone, where first-year undergraduate students go for practical training. The proposal recommended expanding the user group to postgraduate students, staff, and governmental groups.

The PGIA recommended continuance of the split program-type training for graduate students to study both at the PGIA and abroad. (Split programs usually involve some coursework outside Sri Lanka while research and thesis writing are conducted in Sri Lanka. The degree would be granted by the University of Peradeniya.) The PGIA also recommended the recognition of outstanding Ph.D. students as candidates for scholarships at the Consortium universities. Other PGIA recommendations addressed library and computer facilities development. The PGIA also strongly urged the design of a program in management and administrative training for senior PGIA/FA staff.

In terms of the dissemination of PGIA/FA research and teaching activities, the proposal recommended expanded publications and production of teaching materials, development of short courses, seminars, and workshops.

9.5 Implementation Steps

The Memorandum of Understanding states that an activities coordinator for continuing collaboration between the PGIA/FA and the Consortium universities will be appointed at each campus. The coordinator, who would serve for a one-year term, should be either the Dean of the College of Agriculture or his appointed representative. The PGIA/FA would select a committee to coordinate the efforts from Sri Lanka.

The Consortium universities agreed to appoint their coordinators by September 1986. It was also agreed that the work plan for the first year of post-project collaboration would be drawn up by the U.S. universities' coordinators in close consultation with the proposed PGIA/FA committee.

The communications process, elaborated in the tentative implementation strategy, would begin by the end of summer 1986 with an exchange of information regarding research projects at each of the Consortium universities relevant to the concerns of the PGIA/FA. The PGIA/FA staff would complete proposals for collaborative teaching/research in selected areas for submission to the Consortium universities.

In terms of future AID involvement, Mission officials explained that the entire management of the AID Mission would change during the summer of 1986 and that no follow-on project was envisioned. There are areas, however, in which USAID/Sri Lanka could assist the PGIA/FA under the Diversified Agriculture Research Project (DARP), such as through the design and implementation of short courses with DARP funds.

It was recommended that a formal agreement be drawn up between the PGIA/FA and DARP officials that would identify activities to be carried out by the PGIA/FA on behalf of the DARP project. Another recommendation was for Department of Agriculture participants to enroll at the PGIA prior to undertaking training at U.S. institutions in a split program arrangement; participants would then return to the PGIA to complete final degree requirements and to receive their degrees from the PGIA. Representatives of the Consortium universities offered to give special attention to DARP candidates who were recommended by the PGIA/FA and who met admission requirements at their respective institutions.

10.0 PROJECT FUNDING

The Project Grant Agreement between the Governments of Sri Lanka and the United States called for funding support to the AED Project through 1985. The Government of the United States was to supply U.S. \$6.05 million over the life of the project. In 1982 the U.S. contribution was substantially increased by an amendment that added U.S. \$1.45 million to bring the total U.S. funding support to U.S. \$7.5 million and extended the life of the project by one year.

The Government of Sri Lanka agreed to support the PGIA/FA with substantial operational and facility construction funds to guarantee the continued development of the teaching and research programs begun under the AED Project. This was specifically translated into a commitment of approximately Rs. 50 million over the six-

year life of the project. Since the signing of the Project Grant Agreement in 1979, much happened in Sri Lanka that might have kept the Sri Lankan government from fulfilling its Rs. 50 million obligation. In fact, each year it contributed more than was expected. With this year's allocation of approximately Rs. 20 million, Sri Lanka surpassed its original commitment. Its actual contribution from 1979 through 1985 was Rs. 75 million, a full 150% of what it had agreed to in 1979.

Tables XII and XIII show the actual Sri Lankan and U.S. contributions through 1985. Table XIV shows the final Sri Lankan contribution bringing the total effort to over Rs. 95 million.

Table XII
Actual Sri Lankan Contribution to
PGIA/FA Operation and Facilities Construction
(in thousands of rupees)

		1979	1980	1981	1982	1982	1984	1985	Total
PGIA	Rs.	555	658	1,600	2,250	2,391	1,407	1,857	Rs.10,718
FA	Rs.	3,342	5,776	9,606	8,800	9,419	8,967	18,000	Rs. 63,910
Total	Rs.	3,897	6,434	11,206	11,050	11,810	10,374	19,857	Rs. 74,628

Table XIII
Actual Sri Lankan and U.S. Contributions
Compared to Project Grant Agreement
(in thousands of rupees)

	Project Grant Agreement	Actual Contribution
Sri Lanka		
PGIA	Rs. 7,581	Rs. 10,718
FA	42,235	63,910
Subtotal	49,816	74,628
United States	93,775 ^a	122,775 ^b
Total	Rs.143,591	Rs.197,403

a. Represents \$6.05 million converted to rupees at Rs. 15.5 = \$1, the average exchange rate in 1979 when the funds were allocated.

b. Represents \$7.5 million converted to rupees at Rs. 15.5 = \$1 for the first \$6.05 million and Rs. 20 = \$1 for the \$1.45 million added to the allocation in 1982.

Table XIV
1986 Sri Lankan Contribution
(in thousands of rupees)

	Recurrent Expenditures	Capital Expenditures	Rehabilitation of Facilities
Faculty of Agriculture	Rs. 7,000	12,300	1,000
PGIA	Rs. 7,642	12,575	1,310
TOTAL Allocated for 1986		Rs.21,627	

11.0 PROJECT REPORTS

Over the life of the AED Project, the following reports were submitted to USAID/Sri Lanka and all consortium members. Copies of reports are stored at the PGIA/FA Library and at the offices of the Academy for Educational Development in Washington, D.C

Project Report ID No.	Title	Author(s)
PR-79-1	AED Progress Report (7/79)	H.E. Ray
PR-79-2	AED Progress Report (8/79)	H.E. Ray
PR-79-3	AED Progress Report (9/79)	H.E. Ray
PR-79-4	AED Progress Report (10/79)	H.E. Ray
PR-79-5	AED Progress Report (11/79)	H.E. Ray
PR-79-6	AED Progress Report (12/79)	H.E. Ray
Q79-3	AED Quarterly Report (6-9/79)	T. Jogaratnam
Q79-4	AED Quarterly Report (10-12/79)	H.E. Ray T. Jogaratnam
EOT-79-1	Facilities Planning (1)	H.E. Ray
EOT-79-2	End-of-Tour Report. Monogastric Nutrition	H. James Miller E.T. Komegay
EOT-79-3	End-of-Tour Report. Environmental Physiology	F.C. Gwazdukaas
EOT-79-4	End-of-Tour Report. Animal Breeding	T.J. Marlowe
EOT-79-5	End-of-Tour Report. Entomology	R.L. Plenkowski
EOT-79-6	End-of-Tour Report. Agrostology	R.E. Blaser
EOT-79-7	End-of-Tour Report. Entomology	M. Koziarab
EOT-79-8	End-of-Tour Report. Agricultural Engineering	E.C. Collins, Jr.
EOT-79-9	End-of-Tour Report. Agricultural Marketing	C.R. Harston
SR-79-1	Special Report. Meewatura Farm Development	W.G. Downs
	Sri Lanka Agricultural Education Development Project First Annual Field Office Report and Plan of Implementation (6-12/79)	T. Jogaratnam H.E. Ray
PR-80-1	AED Progress Report (1/80)	H.E. Ray
PR-80-2	AED Progress Report (2/80)	H.E. Ray
PR-80-3	AED Progress Report (3/80)	H.E. Ray
PR-80-4	AED Progress Report (4/80)	H.E. Ray
PR-80-5/6	AED Progress Report (5/80)	H.E. Ray
PR-80-7	AED Progress Report (6/80)	H.E. Ray
PR-80-8	AED Progress Report (7/80)	H.E. Ray
PR-80-9	AED Progress Report (8/80)	H.E. Ray
Q80-1	AED Quarterly Report (1-3/80)	T. Jogaratnam H.E. Ray
Q80-2	AED Quarterly Report (4-6/80)	T. Jogaratnam H.E. Ray
Q80-3	AED Quarterly Report (7-9/80)	T. Jogaratnam H.E. Ray
Q80-4	AED Quarterly Report (10-12/80)	T. Jogaratnam, H.E. Ray
EOT-80-1	End-of-Tour Report. Agricultural Communication (Extension)	W.E. Tedrick
EOT-80-2	End-of-Tour Report. Ruminant Nutrition	J.P. Fontenot
EOT-80-3	End-of-Tour Report. Facilities Planning (2)	H.J. Miller
EOT-80-4	End-of-Tour Report. Crop Science (Cropping Systems)	J.L. Starling
EOT-80-5	End-of-Tour Report. Crop Science	O.E. Hately
EOT-80-6	End-of-Tour Report. Soil Physics	A.E. Erickson
EOT-80-7	End-of-Tour Report. Library Development Program	V. Micuda
EOT-80-8	End-of-Tour Report. Food Science	D.L. Lineback
EOT-80-9	End-of-Tour Report. Agricultural Engineering - Power and Machinery	J.F. Perumpral
EOT-80-10	End-of-Tour Report. Facilities Planning (3)	H.J. Miller
EOT-80-11	End-of-Tour Report. Experimental Station Development	W.G. Downs

Project Report ID No.	Title	Author(s)
EOT-80-12	End-of-Tour Report. Agricultural Engineering	C.G. Haugh
EOT-80-13	End-of-Tour Report. Plant Pathology	J.S. Boyle
EOT-80-14	End-of-Tour Report. Agricultural Education	J.W. Holcomb
SR-80-1	Special Report. Development Report For Livestock Field Lab	W.G. Downs
SR-80-2	Special Report. Dodangolla Research Farm Development Report	W.G. Downs
SR-80-3	Special Report. Summary Recommendations from Visiting Staff EOT Reports	W.G. Downs
SR-80-4	Special Report. First Year Academic Performance of Faculty of Agriculture Assistant Lecturers in CAED Consortium Universities under the AED Project	H.E. Ray
SR-80-5	Special Report. Technical Assistance Sri Lanka Agricultural Education Development Project Second Annual Field Office Report (1-12/80)	H.E. Ray
PR-81-1	AED Progress Report (4/81)	T. Jogaratnam Y.D.A. Senanayake
PR-81-2	AED Progress Report (5/81)	H.E. Ray
PR-81-3	AED Progress Report (6/81)	H.E. Ray
PR-81-4	AED Progress Report (7/81)	H.E. Ray
PR-81-5	AED Progress Report (8/81)	J.L. Deegan
PR-81-6	AED Progress Report (9/81)	H.E. Ray
PR-81-7	AED Progress Report (10/81)	H.E. Ray
PR-81-8	AED Progress Report (11/81)	H.E. Ray
PR-81-9	AED Progress Report (12/81)	H.E. Ray
Q81-1	AED Quarterly Report (1-3/81)	T. Jogaratnam, H.E. Ray
Q81-2	AED Quarterly Report (4-6/81)	T. Jogaratnam H.E. Ray
Q81-3	AED Quarterly Report (7-9/81)	T. Jogaratnam, H.E. Ray
Q81-4	AED Quarterly Report (10-12/81)	T. Jogaratnam H.E. Ray
EOT-81-1	End-of-Tour Report. Weed Science	N.L. Hartwig
EOT-81-2	End-of-Tour Report. Agricultural Engineering - Water Management	J.L. Wiersma
EOT-81-3	End-of-Tour Report. Food Science & Technology	J.K. Palmer
SR-81-1	Special Report. Support and Guidance of Dissertation Research by Assistant Lecturers Pursuing Postgraduate Study Under the Agricultural Education Development Project	H.E. Ray
	Minutes of the 1981-82 AED Consortium Council Meeting, Oct. 20-21, 1981 Postgraduate Institute of Agriculture, University of Peradeniya	H.E. Ray
	Sri Lanka Agricultural Education Development Project Third Annual Field Office Report (1-12/81)	T. Jogaratnam Y.D.A. Senanayake H.E. Ray
PR-82-1	AED Progress Report (1/82)	H.E. Ray
PR-82-2	AED Progress Report (2/82)	H.E. Ray
PR-82-3	AED Progress Report (3/82)	H.E. Ray
PR-82-4	AED Progress Report (4/82)	H.E. Ray
PR-82-5	AED Progress Report (5/82)	H.E. Ray
PR-82-6	AED Progress Report (6/82)	H.E. Ray
PR-82-7	AED Progress Report (7/82)	M.W. Thenabadu H.P.M. Gunasena H.E. Ray

Project Report ID No.	Title	Author(s)	Project Report ID No.	Title	Author(s)
PR-82-8	AED Progress Report (8/82)	M.W. Thenabadu H.P.M. Gunasena H.E. Ray	Q84-1	AED Quarterly Report (1-3/84)	T. Jogaratnam H.P.M. Gunasena S.T. Martin
PR-82-9	AED Progress Report (9/82)	M.W. Thenabadu H.P.M. Gunasena H.E. Ray	Q84-2	AED Quarterly Report (4-6/84)	T. Jogaratnam H.P.M. Gunasena S.T. Martin
PR-82-10	AED Progress Report (10/82)	M.W. Thenabadu H.P.M. Gunasena H.E. Ray	Q84-3	AED Quarterly Report (7-9/84)	T. Jogaratnam H.P.M. Gunasena S.T. Martin
PR-82-11	AED Progress Report (11/82)	M.W. Thenabadu H.P.M. Gunasena H.E. Ray	Q84-4	AED Quarterly Report (10-12/84)	T. Jogaratnam H.P.M. Gunasena S.T. Martin
Q-82-1	AED Quarterly Report (1-3/82)	M.W. Thenabadu H.P.M. Gunasena H.E. Ray		1984 Financial Plan, AED Project Quarterly Shipping Report (1-3/84); Quarterly Shipping Report (4-6/84) Quarterly Shipping Report (7-9/84) Quarterly Shipping Report (10-12/84) Minutes of 1983-84 AED Consortium Council Meeting, April 3-4, 1984 Postgraduate Institute of Agriculture University of Peradeniya	S.T. Martin S.T. Martin S.T. Martin S.T. Martin S.T. Martin
Q-82-2	AED Quarterly Report (4-6/82)	M.W. Thenabadu H.P.M. Gunasena H.E. Ray	SR-84-1	Special Report, Recommendations for Administration and Operation of PGLA/FA Instructional Media Unit	S.T. Martin
Q-82-3	AED Quarterly Report (7-9/82)	M.W. Thenabadu H.P.M. Gunasena H.E. Ray		Sri Lanka Agricultural Education Development Project, Sixth Annual Field Office Report (1-12/84)	T. Jogaratnam H.P.M. Gunasena S.T. Martin
Q-82-4	AED Quarterly Report (10-12/82)	S.T. Martin	EOT-85-1	End-of-Tour Report, Seed Physiology	G. W. McKee
EOT-82-1	End-of-Tour Report, Rural Sociology	J.L. Deegan	EOT-85-2	End-of-Tour Report, Plant Physiology	D.P. Knievel
EOT-82-2	End-of-Tour Report, Agricultural Extension	D.F. Seaman	EOT-85-3	End-of-Tour Report, English Language Training	M.B. McCord
EOT-82-3	End-of-Tour Report, Communications-Offset Printing	R.C. Engman	EOT-85-4	End-of-Tour Report, Soil Microbiology	J. M. Bollag
EOT-82-4	End-of-Tour Report, Food Science	J.H. MacNeil	EOT-85-5	End-of-Tour Report, Farm Machinery	W. A. LePort
SR-82-1	Special Report to USAID/SL Project Committee on AED Project	H.E. Ray	EOT-85-6	End-of-Tour Report, Tissue Culture	C. Haramald
SR-82-2	Special Report on Trip to India September 18 - October 3, 1982 Preliminary Evaluation Report No.1 Preliminary Evaluation Report No.2 Preliminary Evaluation Report No.3 Report of Project Evaluation	A.O. Omran H.E. Ray H.E. Ray H.E. Ray M.W. Thenabadu H.P.M. Gunasena S. Pinnaduwege J. Bonner H.E. Ray H.E. Ray	EOT-85-7	End-of-Tour Report, Decision Analysis	D. Beseler
	Minutes of the 1982-83 AED Consortium Council Meeting, November 4-5, 1982, Texas A&M University		Q85-1	AED Quarterly Report (1-3/85)	T. Jogaratnam H.P.M. Gunasena S.T. Martin
	Sri Lanka Agricultural Education Development Project Fourth Annual Field Office Report (1-12/82)	S.T. Martin	Q85-2	AED Quarterly Report (4-6/85)	T. Jogaratnam H.P.M. Gunasena S.T. Martin
EOT-83-1	End-of-Tour Report, Chief-of-Party (6/79-12/82)	H.E. Ray	Q85-3	AED Quarterly Report (7-9/85)	T. Jogaratnam, H.P.M. Gunasena S.T. Martin
EOT-83-2	End-of-Tour Report, Soil Physics	S.T. Willatt	Q85-4	AED Quarterly Report (10-12/86)	T. Jogaratnam H.P.M. Gunasena S.T. Martin
EOT-83-3	End-of-Tour Report, Plant Breeding	A.O. Omran		Quarterly Shipping Report (4-6/85) Special Report, English for Academic Purposes at the PGIA	S.T. Martin M.B. McCord
EOT-83-4	End-of-Tour Report, Production Econ.	C.R. Shumway	SR-85-1	Special Report, AED Project Follow-up Support Suggestions for PGLA/FA and USAID/SL	S.T. Martin
EOT-83-5	End-of-Tour Report, Water Management	P.H. Kirshen	SR-85-2	Minutes of 1985-86 AED Consortium Council Meeting, Oct. 2-4, 1985 Virginia Polytechnic Institute and State University	M. Driscoll
EOT-83-6	End-of-Tour Report, Agrostology and Ruminant Nutrition	V.G. Allen J.P. Fontenot		Sri Lanka Agricultural Education Development Project Seventh Field Office Annual Report (1-12/85)	S.T. Martin
Q-83-1	AED Quarterly Report (1-3/83)	T. Jogaratnam H.P.M. Gunasena S.T. Martin	EOT-86-1	End-of-Tour Report, Chief-of-Party (12/82-12/85)	S.T. Martin
Q-83-2	AED Quarterly Report (4-6/83)	T. Jogaratnam H.P.M. Gunasena S.T. Martin	EOT-86-2	End-of-Tour Report, Aquaculture and Inland Fisheries	L.A. Helfrich
Q-83-3	AED Quarterly Report (7-9/83)	T. Jogaratnam H.P.M. Gunasena S.T. Martin	EOT-86-3	End-of-Tour Report, Agricultural Economics	R. Cramer
Q-83-4	AED Quarterly Report (10-12/83)	T. Jogaratnam H.P.M. Gunasena S.T. Martin	EOT-86-4	End-of-Tour Report, Agrometeorology	J.F. Griffiths
	Sri Lanka Agricultural Education Development Project Fifth Annual Field Office Report (1-12/83)	T. Jogaratnam H.P.M. Gunasena S.T. Martin	EOT-86-5	End-of-Tour Report, Farm Machinery and Post-Harvest Technology	J.F. Perumpral
EOT-84-1	End-of-Tour Report, Statistics and Advanced Genetics	A.O. Omran	EOT-86-6	End-of-Tour Report, Meat Processing	R. Kelly
EOT-84-2	End-of-Tour Report, Animal Nutrition	E.T. Komegay	SR-86-1	Special Report, Sri Lanka Trip Report	M. Driscoll
EOT-84-3	End-of-Tour Report, Animal Breeding and Genetics	T.J. Marlowe	SR-86-2	Special Report, Campus Coordinators Meeting, April 10, 1986	M. Driscoll
EOT-84-4	End-of-Tour Report, Agricultural Waste Management	E.R. Collins	SR-86-3	Special Report, Agricultural Education Workshop on Linkages AED Project Quarterly Shipping Report (1-3/86)	M. Driscoll S. Disenayake
EOT-84-5	End-of-Tour Report, Animal Physiology	F.C. Gwazdauskas		AED Project Quarterly Shipping Report (4-6/86)	S. Disenayake
EOT-84-6	End-of-Tour Report, Forest Ecology	R.J. Huunik		AED Project Quarterly Shipping Report (7-9/86)	S. Disenayake
EOT-84-7	End-of-Tour Report, Rural Sociology	C. Sachs		Sri Lanka Agricultural Education Development Project Final Report (1979-1986)	M. Driscoll
EOT-84-8	End-of-Tour Report, Hydrology	J.L. Neiber			
EOT-84-9	End-of-Tour Report, Plant Physiology	J.C. Shannon			
EOT-84-10	End-of-Tour Report, Agricultural Extension Education	E.P. Yoder			

Agricultural Education Development Project

Final Report 1979-1986

Academy for Educational
Development, Inc.
1255 Twenty-Third St., NW
Washington, DC 20037

OF/ANE
Country *Sri Lanka*
Project No. *313-0049*
BC No *85*

ANNEX 1

The Pennsylvania State University Final Report

Final Report
for the
Sri Lanka Agricultural Education Development Project
at The University of Peradeniya
(AID Contract No. AID/ASIA-C-1397)

by
The Pennsylvania State University

March 29, 1979 - September 30, 1986

I. NARRATIVE SUMMARY

The Consortium for Agricultural Education Development (CAED), consisting of the Academy for Educational Development, Texas A & M University, Virginia Polytechnic Institute and State University, and The Pennsylvania State University, was developed for the purpose of providing technical assistance to Sri Lanka to enhance that nation's institutional capacity for training professional agriculturists. Technical assistance provided by the CAED was implemented in cooperation with the Faculty of Agriculture (FA) and the Postgraduate Institute of Agriculture (PGIA) at the University of Peradeniya in Sri Lanka.

A seven-year contract, with an effective starting date of March 29, 1979, was negotiated between the U.S. Agency for International Development and the Academy for Educational Development, the prime contractor. A subcontract between the Academy for Educational Development and Penn State was signed on August 10, 1979, with the same effective starting date as the prime contractor.

The subcontract assigned Penn State the specific responsibility of arranging for technical assistance and providing training at the master's and doctorate levels to the junior faculty from the University of Peradeniya with an emphasis in personnel from the areas of Crop Science and Agricultural Chemistry. In addition, Penn State assisted in the selection of equipment, developed recommendations for library acquisitions, and took leadership in providing short-term technical assistance for library development and electronic technical training at the Postgraduate Institute of Agriculture.

II. PERSONNEL REPORT

The personnel report will be presented in four sections: 1) home office support; 2) long-term technical assistance; 3) short-term technical assistance; and 4) administrative policy and review support. (See Annex A.)

A. Home Office Support

A Campus Coordinator and Administrative Assistant in the Office of International Agricultural Programs (OIAP) provided support to all faculty, staff, and participants associated with the program. The OIAP worked closely with Department Heads in the College of Agriculture to identify and recruit personnel for technical assistance assignments in Sri Lanka. Background information on Sri Lanka and the project was provided to faculty in preparation for their travel to Sri Lanka.

Predeparture orientation, travel, postdeparture briefings, and other arrangements were handled through the OIAP.

The OIAP also worked closely with Penn State's Graduate School and the various Departments in the College of Agriculture in obtaining approval and admission for applicants for degree training at Penn State. The academic program of each participant was closely monitored by the OIAP and assistance was given to each participant and his/her family to assure a smooth and timely completion of their program. The OIAP was in frequent contact with the major academic advisor of each participant as a method of being informed of problems and accomplishments of the participants.

The home office support provided by the Office of International Agricultural Programs under this AID contract program included:

1. Campus Coordinator - 18.0 person months

Dr. Robert H. McAlexander, Assistant Dean and Director, International Agricultural Programs, served as the Campus Coordinator from the beginning of the project until his retirement on December 31, 1983. Dr. J. Dean Jansma was appointed as the new Assistant Dean and Director, International Agricultural Programs, and assumed the responsibilities of Campus Coordinator for the period of January 1, 1984 to September 30, 1986.

2. Administrative Support - 20.1 person months

Ms. Judy McCormick, Administrative Aide, provided secretarial and administrative support for the life of the project--from March 29, 1979 to September 30, 1986.

B. Long-Term Technical Assistance

One faculty member from Penn State served in a long-term technical assistance position under the project.

1. William Downs - 13.0 person months

Mr. William Downs, Assistant Professor of Agronomy and Supervisor of the Southwestern Field Research Laboratory, Penn State, departed for Sri Lanka on August 24, 1979 to begin his long-term assignment as Farm Manager at the University of Peradeniya. His wife and two daughters joined him in Sri Lanka on September 13 of the same year. Mr. Downs' chief assignment was working with the Faculty of Agriculture in the development of the University farms.

Due to delays in the GSL budget support, a decision was made by the Consortium Council, the Dean of the Faculty of Agriculture, and the Director of the PGIA, to shorten the period of assignment for the Farm Manager from two to one year. Therefore, Mr. Downs concluded his assignment on September 16, 1980, when he and his family departed Sri Lanka for their return to Penn State.

C. Short-Term Technical Assistance

A total of 19 Penn State faculty members provided 30.5 person months of short-term technical assistance under the Penn State subcontract.

1. A. Earl Erickson - 3.0 person months

Dr. A. Earl Erickson, Professor of Soil Science, Department of Crop and Soil Science, Michigan State University, served on a three-month assignment as Soil Physicist at the University of Peradeniya during the period of January 1 through March 31, 1980. During this assignment, he was on leave from Michigan State University and was appointed to a fixed-term position as Professor of Soil Science in the Department of Agronomy at Penn State. The major objective of his short-term assignment was to teach the postgraduate soil physics course at the University of Peradeniya.

2. O. Elwood Hatley - 3.0 person months

Dr. O. Elwood Hatley, Associate Professor of Agronomy Extension, Department of Agronomy, Penn State, served for three months on an assignment as Cropping Systems Specialist during the period of January 1 through March 31, 1980. Dr. Hatley assisted with developing and teaching the cropping systems component of Crop Science 401 at the University of Peradeniya. He also assisted the Crop Science Department in the development of a research program in cropping systems. En route to Sri Lanka, Dr. Hatley visited the International Rice Research Institute (IRRI) in the Philippines to become more familiar with the latest advances in inter-cropping research.

3. James L. Starling - 1.0 person months

Dr. James L. Starling, Professor and Head, Department of Agronomy, Penn State, served on a short-term assignment during the period of January 31-February 25, 1980 to administratively review the academic programs in the Department of Crop Science at the University of Peradeniya.

4. Vladimir Micuda - 1.0 person months

Mr. Vladimir Micuda, Associate Librarian and Head of the Science and Technology Department of the University Libraries at Penn State, served as a Library Consultant at the University of Peradeniya during the period of April 6 to May 4, 1980. The main objectives of Mr. Micuda's visit were to (1) familiarize himself with the University of Peradeniya library system; (2) assist the PGIA librarian in establishing the agricultural library; (3) assist in establishing procedures for identifying and forwarding acquisition requests for

library materials; and (4) assist in establishing procedures for coordination of library acquisitions.

5. David R. Lineback - 1.0 person months

Dr. David R. Lineback, Professor and Head, Department of Food Science, Penn State, accepted a short-term assignment at the University of Peradeniya for the period of June 14 to July 17, 1980. He provided assistance in the (1) preparation of a plan for a food science program at the University of Peradeniya; (2) determination of food science related equipment that should be purchased under the contract program; (3) determining library acquisitions in the food science area; (4) preparing preliminary scopes of work for technical assistance in food science; and (5) identifying suitable dissertation research programs in food science, with emphasis on a research program for Kasipathy Kailaspathy.

6. John S. Boyle - 3.0 person months

Dr. John S. Boyle, Professor of Plant Pathology, Penn State, served on a short-term assignment as Virologist at the University of Peradeniya during the period of September 28 to December 15, 1980. During this assignment, Dr. Boyle (1) taught a postgraduate course in virology; (2) lectured in an undergraduate course on basic virology; (3) identified equipment and facilities required for virus research; and (4) assisted in identifying possible virus diseases in export and vegetable crops.

7. Nathan L. Hartwig - 2.0 person months

Dr. Nathan L. Hartwig, Associate Professor of Weed Science, Department of Agronomy, Penn State, served as Weed Science Specialist at the University of Peradeniya during the period of January 3 to March 6, 1981. The objectives of his assignment were to (1) upgrade the syllabus and postgraduate course in weed biology and control; (2) review existing equipment lists and make suggestions on equipment needed in weed science; and (3) assist in the planning of herbicide trials for the dissertation research of Lionel Perera.

8. Joseph H. MacNeil - 2.0 person months

Dr. Joseph H. MacNeil, Professor, Department of Food Science, Penn State, was on a short-term assignment as Food Science Specialist at the University of Peradeniya during the period of April 26 to June 30, 1982. While in Sri Lanka, his main assignment was to teach a course on the sensory evaluation of food and provide major input in developing a course in food technology. Other objectives of his visit were to (1) review the food science curriculum, (2) determine potential collaborative research in food science with government and industrial organizations; (3) make suggestions on outreach, library

acquisitions, and agricultural chemistry facilities; and (4) review the research being conducted by Kasipathy Kailasapathy.

9. Stephen T. Willatt - 3.0 person months

Mr. Stephen T. Willatt, Senior Lecturer, School of Agriculture, La Trobe University, Australia, was on a short-term assignment in Soil Physics at the University of Peradeniya during the period of January 1 to March 31, 1983. He was on sabbatical leave from La Trobe University and was appointed to a fixed-term position as Instructor in the Department of Agronomy at Penn State. His major responsibilities included (1) teaching a graduate course in soil physics; (2) supervising the dissertation research of Mr. L. G. Yapa; (3) advising on the development of the curriculum in soil physics; (4) providing assistance to the Department of Agricultural Chemistry to develop a relevant research program in soil physics; and (5) assisting in the final planning of the soil physics laboratory, including recommending appropriate types of equipment.

10. Carolyn Sachs - 1.0 person months

Dr. Carolyn Sachs, Associate Professor of Rural Sociology, Department of Agricultural Economics and Rural Sociology, Penn State, served on a short-term assignment as Rural Sociologist during the period of June 26 to July 27, 1984. Dr. Sachs served on the Ph.D. graduate committee of Mr. M. Jayatilaka. The main objectives of her assignment were (1) supervise the dissertation research of Mr. Jayatilaka; (2) present seminars on the sociology of agriculture and women in agriculture; (3) review the Faculty of Agriculture's curriculum in rural sociology; and (4) recommend possible linkages with other research and training institutions and funding agencies.

11. Russell J. Hutnik - 1.0 person months

Dr. Russell J. Hutnik, Professor of Forest Ecology, School of Forest Resources, Penn State, was on a short-term assignment in Agroforestry during the period of July 3-29, 1984. The scope of work for Dr. Hutnik's assignment included (1) assisting Ajith Perera in the design and implementation of his Ph.D. research; (2) reviewing postgraduate courses in Crop Science and suggesting a series of agroforestry courses; (3) recommending areas of future research activities in agroforestry; (4) presenting a seminar on current trends in forest ecology; and (5) examining the syllabi of the final year undergraduate courses with the objective of incorporating the subject of ecology relevant to the study of tree crops.

12. Jack E. Shannon - 1.0 person months

Dr. Jack E. Shannon, Professor of Horticultural Physiology, Department of Horticulture, Penn State, served on a short-term

assignment in Plant Physiology during the period of September 3 to October 4, 1984. The objectives of his assignment were to (1) assist Deepthi Bandara in her dissertation research in Sri Lanka; (2) explore potential research opportunities with various government and industrial organizations; (3) review the undergraduate curriculum in Agricultural Biology with particular reference to the content of plant physiology courses; (4) review PGIA courses offerings in plant physiology; (5) review library collection in plant physiology and recommend additions; and (6) present two seminars.

13. Edgar P. Yoder - 1.0 person months

Dr. Edgar P. Yoder, Associate Professor of Agricultural and Extension Education, Penn State, was on a short-term assignment in Agricultural Extension Education during the period of November 20 to December 21, 1984. The objectives of his assignment were to (1) advise and supervise the dissertation research of Heshan Wickramasuriya; (2) visit the first-year program at Maha Illuppallama and make recommendations for the improvement of the program; (3) make recommendations for an outreach program at Maha Illuppallama; (4) review the postgraduate curriculum in agricultural extension education; (5) review the University's library collection and make recommendations for additional materials; and (6) present three seminars.

14. Guy W. McKee - 1.0 person months

Dr. Guy W. McKee, Professor of Agronomy, Penn State, was on a short-term assignment in Seed Physiology during the period of January 13 to February 11, 1985. The objectives of this short-term assignment included (1) review and supervise the Ph.D. research of Colin N. Peiris; (2) review the syllabi for undergraduate and graduate courses dealing with various aspects of seed technology and seed physiology; (3) plan a short course on seeds; (4) present seminars on seed-related topics; (5) examine the program for seed production, seed storage, and seed certification in the Sri Lankan Department of Agriculture and suggest improvements in teaching and research in seed science in Sri Lanka; and (6) evaluate the need for a central seed research laboratory for Sri Lanka and provide suggestions for its location and needs.

15. Daniel P. Knievel - 1.0 person months

Dr. Daniel P. Knievel, Associate Professor of Crop Physiology, Department of Agronomy, Penn State, was on a short-term assignment in Stress Physiology during the period of March 8 to April 5, 1985. The objectives were for Dr. Knievel to (1) assist S. Pararajasingham with his in-country research; (2) present lectures in a PGIA plant physiology course; (3) advise on the research projects of postgraduate students on topics related to nitrogen fixation and crop

physiology; (4) make recommendations on library acquisitions; and (5) review the curriculum of undergraduate and graduate courses on crop physiology, legume seed production, and related topics.

16. Jean-Marc Bollag - 1.0 person months

Dr. Jean-Marc Bollag, Professor of Soil Microbiology, Department of Agronomy, Penn State, was on a short-term assignment in Soil Microbiology during the period of July 1-24, 1986. Objectives for this assignment included (1) supervise the dissertation research of Pushparany Chanmugathas (2) assist in development of a research program in soil microbiology; (3) evaluate the equipment and review the layout of the new soil microbiology laboratory; (4) present four lectures and a seminar on soil microbiology; and (5) review the syllabus for the postgraduate course in soil microbiology and biochemistry.

17. Chiko Haramaki - 1.5 person months

Dr. Chiko Haramaki, Professor of Ornamental Horticulture, Department of Horticulture, Penn State, served on a short-term assignment as Plant Tissue Culture Specialist during the period of July 18 to August 30, 1985. Responsibilities of Dr. Haramaki included (1) assisting the Department of Crop Science in the design of facilities, equipment, and supplies needed for a teaching and research tissue culture laboratory; (2) assisting in the development of the curriculum and instruction materials for graduate courses in tissue culture and undergraduate courses in plant propagation; (3) identifying other programs in tissue culture and (4) recommending ways of linking these with the PGIA/Faculty of Agriculture tissue culture activities.

18. John D. Balogh - 1.5 person months

19. Thomas W. Collins - 1.5 person months

Mr. John D. Balogh, Research Technologist, Electronic Design Services, and Dr. Thomas W. Collins, Director, Electronic Design Services, in the College of Engineering at Penn State, were on short-term assignments in Sri Lanka during the period of September 16 to October 19, 1985. The scope of work for these two technicians included (1) training laboratory technicians in the trouble-shooting maintenance and calibration of various laboratory equipment; (2) making recommendations for spare parts, consumables, and accessories to increase the capability and life expectancy of the equipment; and (3) producing an audio/visual maintenance program to be used to train other technicians.

D. Administrative Policy Review Support

The administrative review process added significantly to the implementation of the project. The specific format of each meeting was a function of the specific administrative entity included in that particular meeting. It is important to note that the consortium universities donated the time and expertise of all administrators attending these meetings except for the home office support staff.

A total of seven Consortium Council Meetings were held during the life of the project. Four of the meetings were held at the University of Peradeniya and one at each of the three consortium universities. The Dean of Penn State's College of Agriculture attended five of the seven council meetings. Penn State had additional representation at several council and campus coordinator meetings and during the visits of the University of Peradeniya officials and AED contract staff to Penn State. (See Annex B.)

III. PARTICIPANT TRAINING REPORT

Penn State was responsible for providing education and training to the master's and doctorate levels for junior staff members from the Faculty of Agriculture at the University of Peradeniya. In addition, Penn State provided short-term, non-degree training for a librarian from the Postgraduate Institute of Agriculture. A total of 13 University of Peradeniya faculty members received graduate training in the College of Agriculture. Nine participants received training at both the master's and Ph.D. level at Penn State; and four participants who already had their master's degrees, were trained at the Ph.D. level. All 13 participants successfully completed or will complete their graduate programs.

1. Deepthi Bandara - M.S. and Ph.D. degrees - 68.75 person months

Ms. Deepthi Bandara, Department of Agricultural Biology, University of Peradeniya, arrived at Penn State on August 25, 1980 to begin her graduate programs in Horticulture. Dr. Jack C. Shannon, Professor of Horticultural Physiology, Department of Horticulture, served as chairperson of the academic committee for both her Master's and Ph.D. programs.

Deepthi's M.S. thesis is entitled "A Study of Factors Influencing the In Vitro Growth of Maize Kernels." Her M.S. degree was officially awarded in May 1983.

Deepthi spent seven months in Sri Lanka for the in-country portion of her Ph.D. research program. She departed the U.S. for Sri Lanka on June 16, 1984. Dr. Shannon joined her in Sri Lanka during the period of September 3-October 4. Deepthi returned to Penn State on January 13, 1985. Her Ph.D. thesis in Horticulture is entitled "Relationship Between Source-Sink Ratios and Metabolite Compartmentation in Chloroplasts and Cytosol in Leaves of Glycine max (L.) Merrill." She complete her program

and departed for Sri Lanka on May 11, 1986. Her Ph.D. degree was officially awarded on August 16, 1986.

Deepthi's husband, Mr. B.W.M.D. Bandara, joined her at Penn State in October 1981. He enrolled in a graduate program and received his M.S. degree in Agronomy in Fall Semester 1984. The Department of Agronomy provided an assistantship and/or wage payroll for part of his graduate program. While at Penn State, the Bandara's first child and son, Suren, was born on April 25, 1984.

2. Pushparany Chanmugathas - M.S. & Ph.D. degrees - 66.75 person months under AID contract

Mrs. Pushparany Chanmugathas, Department of Agricultural Chemistry, University of Peradeniya, arrived in the U.S. on March 6, 1981, to begin her graduate program in Soil Microbiology at Ohio State University. Dr. Robert Miller, Professor, Agronomy Department at Ohio State, served as her academic advisor. After Dr. Miller moved to North Carolina State University in January 1982, Radha transferred to Penn State to continue her research program. Her graduate program at Penn State began on June 12, 1982. Dr. Jean-Marc Bollag served as chairperson of the academic committee for both her Master's and Ph.D. programs at Penn State.

Radha's M.S. thesis is entitled "Tolerance and Removal of Cadmium by Bacterial Species Under Aerobic and Anaerobic Conditions." Her M.S. degree was officially awarded on January 7, 1984.

Due to specialized equipment needed, Radha spent only one month in Sri Lanka for the in-country portion of her Ph.D. research program. She departed the U.S. on June 22, 1985. Dr. Bollag joined her in Sri Lanka during the period of July 1-25. She returned to Penn State on July 28, 1985. It is anticipated Radha will complete her Ph.D. program in December 1986, which is after the project completion date. The Department of Agronomy will provide assistantship support to Radha for the final three months of her program.

Radha's husband, Mr. C. Chanmugathas, was enrolled in a graduate program in chemistry at Ohio State University when Radha arrived in March 1981 with their five-month old daughter, Anojana. In August 1981, Anojana returned to Sri Lanka to live with her aunt while Radha and Chan completed their studies. She joined her parents at Penn State in December 1983. In June 1982, Radha and Chan transferred from Ohio State to Penn State to complete their graduate programs. Chan enrolled in a Ph.D. degree program in chemistry. The Department of Chemistry provided an assistantship and/or instructorship for part of his graduate program.

3. Malwattage Jayatilaka - Ph.D. degree - 53.75 person months

Mr. Malwattage Jayatilaka, Department of Agricultural Economics and Extension, University of Peradeniya, arrived at Penn State on November 30, 1981 to begin his Ph.D. program in Rural Sociology after completing his master's program at Texas A & M. Dr. Kenneth Wilkinson, Professor of Rural Sociology, Department of Agricultural Economics and Rural

Sociology, served as chairperson of the academic committee for his Ph.D. program at Penn State.

Jaya spent nearly seven months in Sri Lanka for the in-country portion of his Ph.D. research program. He departed the U.S. on April 30, 1984. Because Dr. Wilkinson was unable to travel to Sri Lanka, Dr. Carolyn Sachs, Assistant Professor of Rural Sociology and member of Jaya's graduate committee, traveled to Sri Lanka during the period of June 26-July 27, 1984 to supervise Jaya's research program. Jaya completed his in-country research and returned to Penn State on November 23, 1984. His Ph.D. thesis in Rural Sociology is entitled "Vertical Integration and Social Well-Being of Rural Communities: A Study of Agricultural Modernization in Sri Lanka." He completed his program and departed for Sri Lanka on May 23, 1986. His Ph.D. degree was officially awarded on August 16, 1986.

4. Kasipathy Kailasapathy - Ph.D. degree - 38.0 person months

Mr. Kasipathy Kailasapathy, Department of Agricultural Chemistry, University of Peradeniya, arrived at Penn State on August 20, 1979 to begin his Ph.D. program in Food Science. Dr. Joseph H. MacNeil, Professor of Food Science, served as chairperson of the academic committee for his Ph.D. program.

Kaila spent 18.5 months in Sri Lanka for the in-country portion of his Ph.D. research program. He departed the U.S. on December 11, 1980. Dr. MacNeil was in Sri Lanka during the period of April 26-June 30, 1982 to supervise Kaila's research program. Kaila returned to Penn State on July 5, 1982. His Ph.D. thesis in Food Science is entitled "Utilization Studies on Wing Bean (*Psophocarpus tetragonolobus* [L.] Dc) with Special Emphasis on Functional and Nutritional Properties When Used in Bread Making." Kaila completed his program and departed for Sri Lanka on October 23, 1982. His Ph.D. degree was officially awarded on November 27, 1982.

5. S. Pararajasingham - M.S. and Ph.D. degrees - 61.5 person months under AID contract

Mr. Sivabalasingham Pararajasingham, Department of Crop Science, University of Peradeniya, arrived at Penn State on August 13, 1981 to begin his Master's and Ph.D. programs in Agronomy. Dr. Daniel Knievel, Associate Professor of Crop Physiology, Department of Agronomy, served as chairperson of the academic committee for both graduate programs.

Para's M.S. thesis is entitled "Physiological Aspects of Kernel Abortion in Maize." His M.S. degree was officially awarded on May 19, 1984.

Para spent two months in Sri Lanka for the in-country portion of his Ph.D. research program. He departed the U.S. on March 9, 1985. Dr. Knievel was in Sri Lanka during the period of March 8-April 5 to supervise Para's research program. Para returned to Penn State on May 16, 1985. It is anticipated he will complete all the requirements for

his Ph.D. program in agronomy in October 1986, which is after the project completion date.

Para's wife, Rane, and their 18-month old daughter, Srihari, joined him at Penn State in December 1981. Rane enrolled in a graduate program and expects to complete her M.S. degree in Agronomy. The Department of Agronomy provided support for Rane with an assistantship and/or wage payroll for part of her graduate program.

6. B. Colin Peiris - M.S. and Ph.D. degrees - 61.0 person months

Mr. B. Colin Peiris, Department of Crop Science, University of Peradeniya, arrived at Penn State on March 9, 1981. He enrolled in intensive English training prior to beginning his Master's and Ph.D. programs in Agronomy in June 1981. Dr. Guy W. McKee, Professor of Agronomy, served as chairperson of the academic committee for both graduate programs.

Colin's M.S. thesis is entitled "Comparison of Several Seed Vigor Tests on Corn (Zea mays L.) and Bean (Phaseolus vulgaris L.)." His M.S. degree was officially awarded on August 18, 1984.

Colin spent five months in Sri Lanka for the in-country portion of his Ph.D. research program. He departed the U.S. on October 25, 1984. Dr. McKee joined him in Sri Lanka during the period of January 13-February 11, 1985. Colin returned to Penn State on March 27, 1985. His Ph.D. thesis in Agronomy is entitled "Characterization of Winged Bean (Psophocarpus tetragonolobus (L.) DC.) Accessions Using Isoenzyme Profiles and Morphological Characteristics." He completed his program and departed for Sri Lanka on April 5, 1986. His Ph.D. degree was officially awarded on May 18, 1986.

Colin's wife, Sriyani, joined him at Penn State during the summer of 1981. She enrolled in a graduate program and received her M.S. degree in Agronomy on August 16, 1986. The Department of Agronomy provided support with an assistantship and/or wage payroll for part of her graduate program. The Peiris' first child and son, Niluk, was born on July 24, 1984.

7. Ajith Perera - M.F.R. and Ph.D. degrees - 60.25 person months

Mr. Ajith Perera, Department of Crop Science, University of Peradeniya, arrived at Penn State on March 9, 1981 to begin his Master's and Ph.D. programs in Forestry. Dr. Kim Steiner, Associate Professor of Forest Genetics, School of Forest Resources, served as chairperson of the academic committee for his M.F.R. program. Dr. Russell Hutnik, Professor of Forest Ecology, School of Forest Resources, served as chairperson of Ajith's academic committee for his Ph.D. program.

Ajith's M.F.R. thesis is entitled "Principles of Productivity and Design in Agrosilvicultural Systems." His M.F.R. degree was officially awarded at Spring Commencement in May 1983.

Ajith spent 10.5 months in Sri Lanka for the in-country portion of his Ph.D. research program. He departed the U.S. on June 26, 1984. Dr. Hutnik joined him in Sri Lanka during the period of July 3-29, 1984.

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Ajith returned to Penn State on May 8, 1985. His Ph.D. thesis in Forest Science is entitled "An Evaluation of Regeneration Potential in Pinus Plantations in the Central Region of Sri Lanka." Ajith completed his program and departed for Sri Lanka on March 15, 1986. His Ph.D. degree was officially awarded on May 18, 1986.

Ajith's wife, Anjalee, visited Penn State for about two months during the fall of 1982.

8. Lionel Perera - Ph.D. degree - 51.25 person months

Mr. Lionel Perera, Department of Crop Science, University of Peradeniya, arrived at Penn State on August 20, 1979 to begin his Ph.D. program in Agronomy. Dr. Nathan Hartwig, Professor of Weed Science, Department of Agronomy, served as chairperson of the academic committee for his Ph.D. program.

Lionel spent nearly two years in Sri Lanka on the in-country portion of his Ph.D. research program. He departed the U.S. on December 9, 1980. Dr. Hartwig joined him in Sri Lanka during the period of January 3-March 6, 1981. Lionel returned to Penn State on November 29, 1982. He completed his program and departed for Sri Lanka on November 29, 1983. His Ph.D. thesis in Agronomy is entitled "Weed Control Systems in Corn, Legumes Intercropping Systems." His Ph.D. degree was awarded on January 7, 1984.

9. S. L. Ranamukarachchi - M.S. and Ph.D. degrees - 58.5 person months

Mr. S. L. Ranamukarachchi, Department of Crop Science, University of Peradeniya, arrived at Penn State on August 25, 1980 to begin his Master's and Ph.D. programs in Agronomy. Dr. Elwood Hatley, Associate Professor of Agronomy Extension, Department of Agronomy, served as chairperson of the academic committee for both graduate programs.

Rana's M.S. thesis is entitled "Potential for Growing Soybeans for Double Cropping in Central Pennsylvania." His M.S. degree was officially awarded in August 1983.

Rana spent one year in Sri Lanka for the in-country portion of his Ph.D. research program. He departed the U.S. on September 10, 1983. Dr. Hatley did not travel to Sri Lanka during the time Rana was in country. He had, however, served on a three-month assignment in January through March 1980 and was, therefore, very familiar with the problems and needs associated with Rana's in-country research program. Rana returned to Penn State on September 23, 1984. His Ph.D. thesis in Agronomy is entitled "Productivity of Corn (*Zea mays* L.), Mung Bean (*vigna radiata* L.) Intercropping Systems with Special Reference to Plant Population, Row Spacing, and Nitrogen Rates in the Dry Zone of Sri Lanka." Rana completed his program and departed for Sri Lanka on July 9, 1985. His Ph.D. degree was officially awarded in August 1985.

Rana's wife, Sandya, traveled to Penn State with Rana when he returned from his in-country research program. She remained at Penn State until the conclusion of Rana's program.

10. Alagacone Sriskantha - M.S. and Ph.D. degrees - 62.75 person months

Mr. Alagacone Sriskantha, Department of Agricultural Biology, University of Peradeniya, arrived at Penn State on August 25, 1980 to begin his M.S. and Ph.D. programs in Plant Pathology. Dr. John Boyle, Professor of Plant Pathology, served as chairperson of the academic committee until his retirement in April 1982. Dr. Charles Romaine, Associate Professor of Plant Pathology, served as chairperson of the academic committee for the remainder of his graduate program.

Sri's M.S. thesis is entitled "A Correlated Study Between Plant Virus Induced Intracellular Inclusions and Serology as Methods for the Identification of Plant Viruses." His M.S. degree was officially awarded on August 1982.

Sri spent four months in Sri Lanka for the in-country portion of his Ph.D. research program. He departed the U.S. on May 20, 1984. Dr. Romaine was unable to join Sri in Sri Lanka at that time. Dr. Boyle, however, had spent three months in Sri Lanka during the period of October through December 1980 and provided insight into the needs and problems of conducting research in Sri Lanka. Sri returned to Penn State on September 17, 1984. His Ph.D. thesis in Plant Pathology is entitled "Biochemical characterization of Viruses in Agaricus bisporus." He completed his program and departed for Sri Lanka on November 16, 1985. His Ph.D. degree was officially awarded in December 1985.

11. V.A.D. Sumanasinghe - M.S. and Ph.D. degrees - 69.75 person months

Mr. V.A.D. Sumanasinghe, Department of Agricultural Biology, University of Peradeniya, arrived at Penn State on August 25, 1980 to begin his M.S. and Ph.D. programs in Horticulture. Dr. Richard Craig, Professor of Plant Breeding, Department of Horticulture, served as chairperson of the academic committee for both graduate programs.

Sumane's M.S. thesis is entitled "Inheritance of Leaf Shape, Flower Shape, Flower Color, and Stem Color in Exacum Affine Balf. F. (Gentianaceae)." His M.S. degree was officially awarded on March 5, 1983.

Sumane spent 6.5 months in Sri Lanka for the in-country portion of his Ph.D. research program. He departed the U.S. on December 29, 1983. Dr. Craig was unable to join Sumane in Sri Lanka at that time. Sumane returned to Penn State on July 15, 1984. His Ph.D. thesis in Horticulture is entitled "Electrophoretic, Cytogenetic, Crossability, and Morphological Studies of Exacum (Gentianaceae)." He completed his program and departed for Sri Lanka on June 12, 1986. His Ph.D. degree was officially awarded on August 16, 1986.

12. Heshan A. Wickramasuriya - M.Ed. & Ph.D. degrees - 59.75 person months

Mr. Heshan Aponso Wickramasuriya, Department of Agricultural Economics and Extension, University of Peradeniya, arrived at Penn State on August 25, 1980 to begin his M.S. and Ph.D. degree programs in

Agricultural and Extension Education. Dr. William I. Lindley, Assistant Professor, Department of Agricultural Education, served as Heshan's academic advisor until he left Penn State for a permanent assignment with FAO in Rome in 1983. Dr. Edgar P. Yoder, Associate Professor of Agricultural and Extension Education, served as chairperson of the academic committee for the remainder of his graduate programs.

Heshan's M.S. thesis is entitled "The Development of a Manual for Training Rural Development Leaders in Sri Lanka." His M.S. degree was officially awarded in May 1983.

Heshan spent nearly eight months in Sri Lanka for the in-country portion of his Ph.D. research program. He departed the U.S. on May 17, 1984. Dr. Yoder joined Heshan in Sri Lanka during the period of November 20-December 21, 1984. Heshan returned to Penn State on January 11, 1985. His Ph.D. thesis in Agricultural and Extension Education is entitled "The Identification of Focal Individuals and the Analysis of Communication Networks in Four Sri Lankan Villages." He completed his program and departed for Sri Lanka on August 15, 1985. His Ph.D. degree was officially awarded in December 1985.

Heshan's wife, Lucky, joined him at Penn State in December 1980. While at Penn State, their first child and daughter, Hevithri, was born in the fall of 1981.

13. Gnanapala L. Yapa - Ph.D. degree - 43.25 person months

Mr. Gnanapala L. Yapa, Department of Agricultural Chemistry, University of Peradeniya, arrived at Penn State on May 18, 1980 to begin his Ph.D. degree program in Agronomy. Dr. Daniel Fritton, Professor of Soil Physics, Department of Agronomy, served as chairperson of the academic committee for his graduate program.

Yapa spent 13 months in Sri Lanka for the in-country portion of his Ph.D. research program. He departed the U.S. on May 31, 1982. Dr. Fritton was unable to travel to Sri Lanka during that period. Mr. Stephen T. Willatt, Senior Lecturer, School of Agriculture, La Trobe University, Australia, was on a three-month assignment during the period of January 1-March 31, 1983 to assist Yapa with his research program. Yapa returned to Penn State on July 3, 1983. His thesis is entitled "Root Growth Studies on Legumes in Two Soils of Sri Lanka." He completed his program and departed for Sri Lanka on December 24, 1983. His Ph.D. degree was officially awarded on May 19, 1984.

Yapa's wife, Sujatha, joined him at Penn State in September 1980. Lankesha, their 3 1/2 year old daughter, joined them in March 1981.

14. Irangani Mudannayake - non-degree - 3.0 person months

Miss Irangani Mudannayake, Assistant Librarian, Postgraduate Institute of Agriculture, University of Peradeniya, arrived at Penn State on July 1, 1984 to begin a three-month program in library training. Mr. Vladimir Micuda, Head of the Science and Technology Department, The Pennsylvania State University Libraries, coordinated her program at Penn

State. She completed her program and departed for Sri Lanka on September 26, 1984.

A total of 758.25 person months of training was provided by Penn State for the 14 participants. Eight of the participants brought their spouses and three children to Penn State during their training program. Three Sri Lankan children were born to the participants while they were in the U.S. Four spouses received or will receive graduate degrees from Penn State.

Support for the 14 project participants was in accordance with the allowances for AID participants as outlined in Participant Training Handbook 10. Each participant was provided with a monthly maintenance allowance to cover their living expenses and tuition, a monthly book allowance, calculator allowance, and typing allowance in direct support of their coursework. Each long-term participant was also provided with a computer and research allowance to cover expenses related to conducting their research program. A thesis allowance for both the master's and Ph.D. programs covered the costs associated with the typing, copying, and binding of the theses, and a book shipment allowance was provided for shipping their books and course materials to Sri Lanka. Each participant was provided with a travel allowance to permit them to attend professional meetings, mid-winter community seminars, or other travel related to their graduate programs. International airfares were provided for travel between Penn State and Sri Lanka, including round-trip travel to Sri Lanka to conduct the in-country portion of their Ph.D. research program. A membership in a professional organization of their choice was provided at the conclusion of their program.

In addition to expenses associated with their research programs at Penn State, the research/computer funds were used by participants to purchase computers, lab equipment, chemicals, etc. for shipment back to the University of Peradeniya. The participants were able to use these research/computer funds because many of the Departments at Penn State provided additional support for the participants' graduate programs. Approximately \$18,000 worth of equipment became the property of the University of Peradeniya through the purchases of equipment from the participants' computer/research allowances. (See Annex C.)

IV. OTHER PENN STATE CONTRIBUTIONS

The faculty members, who served as chairpersons and members of the graduate committees, provided many hours of support and guidance to the participants. Unquantifiable, but of perhaps the most enduring benefit from the project, are the mutual and lasting friendships and working relationships that have developed between the participants' and the Penn State faculty members.

Faculty members in the College of Agriculture donated over 50 boxes of professional journals and books to the Library at the Postgraduate Institute of Agriculture. One faculty member donated 33 boxes of used laboratory equipment for use in setting up a seed testing laboratory at the University of Peradeniya.

Penn State's Dean of the College of Agriculture provided financial support for Dr. Y.D.A. Senanayake, Dean of the Faculty of Agriculture, University of Peradeniya, to serve as Visiting Professor of Agronomy at Penn State for six months during the period of June through December 1982.

The College of Agriculture also provided support through the Title XII Strengthening Grant for Dr. Kim Steiner to travel to Sri Lanka in May 1986 to investigate future linkages and research opportunities. His visit was coordinated by Dr. Ajith Perera. Dr. Richard Fox, Professor of Soil Science, plans to visit the University of Peradeniya under the Strengthening Grant support later in 1986.

V. LESSONS LEARNED FROM PROJECT

The successful completion of doctoral programs by all 13 of the Sri Lankan participants enrolled at Penn State is indicative of the excellent training received at the BSc level in Sri Lanka and the care with which each participant was selected. The 100 percent success rate is significantly higher than expected for a grouping of foreign or domestic students entering graduate programs in the College of Agriculture at Penn State.

There is a need for improved communications with special attention to the fact that completion of a M.S. and/or a Ph.D. program requires the student to present his/her committee a report on their independent research work. The predicting of the time it takes to complete a research project is affected by a large number of variables which cannot be controlled by the student or his/her academic committee. Therefore, predicting the time required for completion of graduate programs must be based on aggregates for a group of students rather than for a specific student.

USAID should reconsider their approach for obligating funds over the life of a project. It is difficult to justify a system that spends a million dollars on a project one year and zero the next. A graduate decrease in program funding is needed if the highly desirable long-term institutional linkages are to be developed to protect the original educational investment.

Prompt and clear communications is always a problem and all parties associated with the project need to be sure that there is an adequate and timely flow of information.

VI. FUTURE LINKAGES

Funding constraints being faced by all parties; i.e., GSL, USAID, and the consortium members, make the development of an active linkage program very difficult. However, a Memorandum of Understanding (MOU) was signed between the University of Peradeniya and the three consortium universities during the June 1986 meeting of the Consortium Council. An implementation strategy was also agreed to as a supplement to the more formal MOU.

Within the limitations of the resources available, Penn State plans to be an active participant in the activities outlined in the implementation strategy. There are several cooperative ventures currently being planned, which will help insure an institutional linkage between the University of

Peradeniya and Penn State. Individuals involved in these plans include: 1) Drs. Perera and Steiner in the area of agroforestry; 2) Drs. Bandara and Arteca in plant physiology; 3) Drs. Peiris and McKee in seed physiology and technology; and 4) Drs. Sangakkara and Fox in soil fertility. Dr. Steiner has visited Sri Lanka under non-project sponsorship in the summer of 1986 and Dr. Fox plans to visit with Dr. Sangakkara later this year. Dr. McKee has applied for funds to continue the earlier work with Dr. Peiris while Drs. Bandara and Arteca are working on a joint proposal for outside funding.

ANNEX A

PENN STATE PERSONNEL
SRI LANKA AGRICULTURAL EDUCATION DEVELOPMENT PROJECT

Personnel, Positions, and Dates of Travel to Sri Lanka

Robert H. McAlexander(a)(b)

Project Coordinator, July 1, 1979-December 31, 1983 (part-time)

Project Review Team, January 29-February 10, 1980; October 18-23, 1981

William Downs(a)(b)

Farm Manager, August 1, 1979-September 17, 1980

A. Earl Erickson(c)

Soil Physics Specialist, January 1-March 31, 1980

O. Elwood Hatley(b)

Cropping Systems Specialist, January 1-March 31, 1980

James L. Starling(b)

Crop Science Academic Programs, January 31-February 25, 1980

James Beattie(b)

Dean, College of Agriculture, Project Review Team, February 2-10, 1980

Vladimir Micuda(b)

Librarian, April 3-May 6, 1980

David R. Lineback(b)

Food Scientist, June 14-July 17, 1980

John S. Boyle(b)

Plant Pathologist (Virology), September 28-December 15, 1980

Nathan L. Hartwig(b)

Weed Science Specialist, January 3-March 6, 1981

Samuel H. Smith(b)

Dean, College of Agriculture, Project Review Team, October 18-23, 1981;
April 1-6, 1984

Joseph H. MacNeil(b)

Food Scientist, April 27-July 1, 1982

Stephen Willatt(c)

Soil Physics Specialist, January 1-March 31, 1983

J. Dean Jansma(a)(b)

Project Coordinator, January 1, 1984-September 30, 1986 (part-time)

Project Review Team, April 1-6, 1984; June 1-7, 1986.

Carolyn Sachs(b)
Rural Sociologist, June 26-July 27, 1984

Russell J. Hutnik(b)
Forest Ecologist, July 3-29, 1984

Jack C. Shannon(b)
Plant Physiology, September 3-October 4, 1984

Edgar P. Yoder(b)
Agricultural and Extension Education Specialist, November 20-December 21, 1984

Guy W. McKee(b)
Seed Physiology, January 13-February 11, 1985

Daniel P. Knieval(b)
Crop Physiologist (Stress), March 8-April 5, 1985

Jean-Marc Bollag(b)
Soil Microbiologist, July 1-24, 1985

Chiko Haramaki(b)
Plant Tissue Culture Specialist, July 18-August 30, 1985

John D. Balogh(b)
Equipment Maintenance Specialist, September 16-October 29, 1985

Thomas W. Collins(b)
Equipment Maintenance Specialist, September 16-October 29, 1985

Kim C. Steiner(b)
Agroforestry, May 10-June 3, 1986*

- (a) Long-term assignment, in excess of one year
- (b) Member of Penn State's permanent faculty
- (c) Fixed-term appointment with Penn State

*Travel was not under Sri Lanka AID Project, but was supported by Strengthening Grant funds.

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ANNEX B

List of Meetings in Support of
Sri Lanka Agricultural Education Development Project

<u>DATE</u>	<u>MEETING</u>	<u>PENN STATE REPRESENTATION</u>
November 1979	Campus Coordinator Meeting Washington, D.C.	Dr. Robert McAlexander
February 1980	Consortium Council Meeting University of Peradeniya	Dr. James Beattie, Dean Dr. Robert McAlexander
November 1980	Consortium Council Meeting Penn State	Dr. James Beattie, Dean Dr. Robert McAlexander Dr. James Starling, Head, Agronomy Department Dr. Frank Witham, Head Horticulture Department
July 1981	Howard Ray's Visit to Penn State	Selected faculty members
October 1981	Consortium Council Meeting University of Peradeniya	Dr. Samuel Smith, Dean Dr. Robert McAlexander
January 1982	James Bonner's Visit to Penn State	Selected faculty members
April 1982	Howard Ray & Barbara O'Grady's Visit to Penn State	Selected faculty members
October 1982	Panditharatne, Gunasena, Thenabadu, & O'Grady Visit to Penn State	Selected faculty members
November 1982	Consortium Council Meeting Texas A & M	Dr. Robert McAlexander
March 1983	Howard Ray & Barbara O'Grady's Visit to Penn State	Selected faculty members
October 1983	Jogarathnam, Gunasena, Bonner, & Martin Visit to Penn State	Selected faculty members
April 1984	Consortium Council Meeting University of Peradeniya	Dr. Samuel Smith, Dean Dr. J. Dean Jansma
September 1985	Jogarathnam, Gunasena, Martin, & Driscoll Visit to Penn State	Selected Faculty Members

October 1985	Consortium Council Meeting Virginia Polytechnic	Dr. Wayne Hinish, Acting Dean Dr. J. Dean Jansma Ms. Judy McCormick
April 1986	Campus Coordinators Meeting Irving, Texas	Ms. Judy McCormick
June 1986	Consortium Council Meeting University of Peradeniya	Dr. J. Dean Jansma

ANNEX C

Listing of Equipment and Supplies
Purchased with Research/Computer Funds
by Participants under
The Sri Lanka Agricultural Education Development Project
Carried or Shipped to Sri Lanka

Deepthi Bandara - \$1,952

IBM PC computer, model 176, and monitor, \$1,222, shipped by An-Mar
Epson LX80 printer, \$280, shipped by An-Mar
Printer cable, \$32, shipped by An-Mar
Communications adapter, \$70, shipped by An-Mar
Printer adapter, \$53, shipped by An-Mar
DOS 3.2 operating system, \$60, shipped by An-Mar
Lotus 1,2,3, \$235, shipped by An-Mar

Pushparany Chanmugathas - \$2,815

IBM PC computer, model 176, \$1,222, shipped by An-Mar
Lotus 1,2,3, software, \$235, shipped by An-Mar
Epson LQ1500 printer, \$946, shipped by An-Mar
Graphics board and cable, \$412, shipped by An-Mar

W. Jayatilaka - \$635

SPSS/PC software, \$635, shipped by An-Mar

S. Pararajasingham - \$1,568

IBM PC computer, \$1,222, shipped by An-Mar
IBM proprinter, \$346, shipped by An-Mar

Colin Peiris - \$2,721

PH meter, model 800, \$482, shipped by An-Mar
Centrifuge, \$317, shipped by An-Mar
Vacuum cleaner, \$90, shipped by An-Mar
Poly foil poly bags, \$444, shipped by An-Mar
Transformer, \$51, shipped by An-Mar
33 boxes of lab equipment, donated, shipped by An-Mar
Canon zoom lens, \$84, carried by Colin
Platinizing solution, \$74, carried by Colin
Pipetman 20, \$160, carried by Colin
Pipette pump, \$7, carried by Colin
Various chemicals, \$1,012, some shipped via surface by An-Mar, a few carried
by Colin

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Ajith Perera - \$2,849

Forestry Supplies, \$800, carried by Ajith when he return for research
Geiger, forestry supplies, \$272, carried by Ajith when he returned for
research

IBM PC computer, \$1,020, carried by Ajith
IBM PC printer adapter, \$51, carried by Ajith
Epson LX80 printer, \$250, carried by Ajith
SYSTAT software, \$396, carried by Ajith
Printer cable, \$25, carried by Ajith
Tractor unit for printer, \$35, carried by Ajith

V.A.D. Sumanasinghe - \$3,231

Power generator, model EC458, \$706, shipped by An-Mar
IBM PC computer, model 5155, and software, \$1,800, shipped by An-Mar
Epson LX80 printer, \$245, shipped by An-Mar
Diskettes, \$52, shipped by An-Mar
Ribbons, \$32, shipped by An-Mar
Chemicals, \$396, shipped by An-Mar
Electrostarch, on order

Heshan Wickramasuriya - \$2,061

IBM PC computer, \$1,465, shipped by An-Mar
DOS 2.1 operating system, \$46, shipped by An-Mar
MINITAB software, \$100, shipped by An-Mar
LX80 ribbons, \$24, shipped by An-Mar
Printer adapter, \$53, shipped by An-Mar
Epson LX80 printer, \$245, shipped by An-Mar
Epson LX80 printer cable, \$25, shipped by An-Mar
Diskettes, \$103, shipped by An-Mar

ANNEX 2
Texas A&M University Final Report

FINAL REPORT

AGRICULTURAL EDUCATION DEVELOPMENT PROJECT:
POSTGRADUATE INSTITUTE OF AGRICULTURE
THE UNIVERSITY OF PERADENIYA, PERADENIYA, SRI LANKA

AID/ASIA C-1397

by

Ms. Violetta Cook

and

Dr. James Goodwin

Office of International Agricultural Programs
Texas A&M University

College Station, Texas

23 September 1986

Texas A&M University is pleased to have participated in a consortium with its partners, Virginia Tech, Penn State, and the Academy for Educational Development, in implementing the US Agency for International Development's Agricultural Education Development Project to develop the resources of the University of Peradeniya in Sri Lanka. Texas &M University provided over eleven months of short-term technical assistance in Sri Lanka. Table I summarizes this effort. In addition to the short-term technical assistance, Abbas Jmran, a plant breeder, was in Sri Lanka from January 1981 to May of 1983 as part of the consortium team to provide long-term technical assistance. He was one of the three long-term advisors serving in Sri Lanka.

On campus support to the project was handled through the Office of International Agriculture Programs and its predecessors through the efforts of Drs. Paul Creech, Morris Bloodworth and James Goodwin as campus coordinators and Dr. Edna Koenig and Ms. Violetta Cook as project administrators. Dr. H.O. Kunkel, Dean of the College of Agriculture, also spent numerous hours in support of this project serving as the Texas A&M University member of the Consortium Council. He also made two trips to Sri Lanka in support of the Project.

Through the efforts of Dean Kunkel, Professor Senanayake of the Post Graduate Institute of Agriculture in Sri Lanka spent a sabbatical in the Department of Horticulture at Texas A&M University from January 1983 through September 1983. Over

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TABLE I. SHORT-TERM TECHNICAL ASSISTANCE AGRICULTURAL
EDUCATION DEVELOPMENT PROJECT / SRI LANKA

Technical Advisor	Discipline	Year
Harston, Professor Emeritus	Agricultural Economics	1979 3 mo.
Tedrick, Program Specialist Extension Data Mgmt.	Agricultural Economics	1980 1 mo.
Seaman Professor	Agricultural Education	1982 ~ 1 mo.
Nieber Professor	Agricultural Engineering	1984 ~1.2 mo.
Shumway Professor	Agricultural Economics	1984 1 mo.
Kelley Professor	Entomology	1985 1 mo.
Reed Associate Professor	Horticulture Science	1985 .5 mo.
Taber Research Scientist	Plant Pathology	1985 .5 mo.
Lepori Professor	Agricultural Engineering	1985 1.25 mo.
Griffiths Professor	Meteorology	1985 .25 mo.
Bessler Associate Professor	Agricultural Economics	1985 .75 mo.

\$26,000 in salary and benefits were set aside for providing this opportunity for Professor Senanayake.

Fourteen Sri Lankan students were selected for advanced degree training at Texas A&M University. Of the fourteen, one student, Victor Rajakulendran, was terminated from the project in 1984. Mr. Rajakulendran, even though terminated from the project, remained at Texas A&M university using his own resources and received his PhD in Entomology in August 1986. Of the remaining thirteen students, eight completed the PhD program, one completed a masters at Texas A&M University transferring to Penn State for the PhD. One student completed a masters and returned to Sri Lanka. Three others are in the final stages of completing their dissertations.

Four students who completed the PhD under project funding have not returned to duties in Sri Lanka; all are Tamils. Two of these apparently have accepted employment in either Taiwan or India. The status of the other two students who left Texas A&M in August 1986 is not known. The previously mentioned student who was terminated from the project is also a Tamil. Students now completing their programs are Sinhalese.

Table II summarizes the academic training program at Texas A&M University, a major component of this project. Noted on the table are name of student, time of departure, and degree received or expected.

TABLE II.

ACADEMIC PARTICIPANT TRAINING PROGRAM

STUDENT	DEGREE AND ADVISOR	DATE OF DEPARTURE
Bogahawatte, Cyril	PhD Agricultural Economics C. Harston	January 1982
Wickremasinghe, Indrangani	MS Soil and Crop Science A.J. Bockholt	February 1982
Sivayoganathan, Chelliah	PhD Interdisciplinary Education D. Seaman	December 1982
Dayawathie, Bentara	PhD Entomology F. Gilstrap	June 1983
Jegasothy, Kandiah	PhD Agricultural Economics C. Harston	December 1984
Fernandez, George	PhD Horticulture C. Miller	December 1985
Puvirajasinghe, Patrick	PhD Soil and Crop Science C. Van Bavel	August 1986
Prathapar, Sanmugan	PhD Agricultural Engineering D. Reddell	August 1986
Abegunawardana, Piyasena	PhD Agricultural Economics D. Bessler and K. Strzepek	September 1986
Ariyaratne, Arachchi	PhD Agricultural Engineering W. LePori	not completed
Rajapakse, Nihal	PhD Horticulture D. Reed	not completed
Rajapakse, Syriani	PhD Horticulture C. Miller	not completed
Jayatilaka, Malwattage	MS Sociology (transfer to Penn State for PhD)	
Rajakulendran, Victor	TERMINATED FROM PROJECT 1984	

Fernandez ---- did not return
 Jegasothy --- did not return

Prathapar --- has not reported for duty
 Puvirajasinghe - has not reported for duty

Texas A&M University utilized part of its Title XII Strengthening Grant funds in support of the Sri Lankan project enabling Dr. Kenneth Strzepek of the Texas A&M University Civil Engineering Department and co-chairman of Piyasena Abegunawardana's dissertation committee, to spend time in Sri Lanka in August of 1985 while Piyasena was there doing his research. Under the direction of Dr. Strzepek a young American undergraduate student, John Humphreys, assisted Piyasena in the final stages of his dissertation analysis. As a result of this rewarding and invaluable experience, Mr. Humphreys decided to participate in a study abroad program under the auspices of the Experiment in International Living in Sri Lanka. Each student participating in this program is required to do an independent study which Mr. Humphreys will do under Piyasena Abegunawardana. It is this type of post-project linkage that we often fail to document, but one that is vitally important for the future and serves to encourage young American undergraduates to seek careers in international development.

In addition to Dr. Strzepek, Dr. James Goodwin, Entomologist and Campus Coordinator for the project, was able to spend one week in Sri Lanka in February 1986 under Strengthening Grant funding.

CONSLUSIONS

One of the major components of this project was academic training of students. The Sri Lankan students for the most part

were excellent students, some cited by their major professors as among the hardest working and brightest of their students. While to some who reside outside the academic community it seemed that many of the students were taking an inordinate amount of time to complete their programs, it should be noted that to receive both a masters degree and doctorate degree takes time even for the native American. When a student is both an international student requiring additional English language training and ill-prepared for the discipline in which he or she was selected to receive training, this will take even more time. No two students are alike nor are their programs comparable. Non-academic personnel cannot predetermine how much time will be needed to complete a particular program. If particular degree objectives have been determined by a project, then project personnel in-country must recognize that the training institution will do everything possible to insure that the student complete that degree within a reasonable time schedule, but cannot insure that it will be completed in a pre-determined time (eg. eighteen months or four years). Degree-granting institutions have rules that apply to all students whether or not they are project participants.

While we all regret that some students have not returned to Sri Lanka, we as an institution cannot be held responsible. As an academic institution, we are first and foremost dedicated to providing the best possible academic training for all students

including those selected by project personnel. If perceived internal conditions in a country are such that some students feel that they cannot return at the time of their scheduled return, we can do little more than to continue to encourage them to return.

As part of the lessons learned from this project, we would like to point out the importance of coordinating responsibilities with regard to the dependents of participants who join the participants at the training institution. Universities cannot be made responsible for monitoring whether or not participants provide adequate health insurance for their dependents or whether that dependent has any pre-existing conditions that may make insurability questionable. Often dependents are permitted to leave the home country without providing the necessary documentation noted on the Dependent Certification form.

All things considered, Texas A&M University considers that this have been an excellent project. It is hoped that the relationship established between Texas A&M University and the University of Peradeniya will be long-standing. A Memorandum of Understanding between Texas A&M University and the University of Peradeniya was signed in June of 1986. This agreement serves as a basis for cooperative efforts between the two institutions. As part of the continuing linkages between the two institutions, students from the University of Peradeniya will take coursework at Texas A&M University which will transfer to the University of Peradeniya where the student will receive the degree. One

student is currently enrolled at Texas A&M in the Department of Entomology under this program and another is scheduled to begin during the spring semester in the Department of Wildlife and Fisheries. Other possibilities are being explored.

ANNEX 3

**Virginia Polytechnic Institute and State University
Final Report**

September 12, 1986

FINAL REPORT -- VIRGINIA TECH
Agricultural Educational Development Project
The Postgraduate Institute of Agriculture
University of Peradeniya
Kandy, Sri Lanka

* * *

I. Introduction:

Virginia Tech was privileged to be actively involved in implementing this important institution strengthening project which was jointly sponsored by the Government of Sri Lanka and the U.S. Agency for International Development. The prime contractor, the Academy for Educational Development, and the three universities: Pennsylvania State University, Texas A & M University, and Virginia Tech worked closely and effectively together to assure the success of this project. Much of the success should be attributed to the excellent ideas and solid advance planning done by key officials of the Government of Sri Lanka and the University of Peradeniya. The second major positive factor was the high caliber of people involved in planning and implementing all phases of the project -- Government of Sri Lanka, USAID, AED, and the four universities.

II. Participant Training Conducted at Virginia Tech

Table 1 cites the long-term and short-term training participants, subject matter areas, and training completion dates. Twelve of the thirteen long-term training participants will successfully complete and obtain the intended academic degrees. One participant was returned to Sri Lanka by Virginia Tech for inadequate academic performance. All short-term training participants proved to be conscientious students and successfully completed their specific programs.

The high quality of the long and short-term participants trained at Virginia Tech made this human resource development and institutional strengthening effort a model project.

III. Technical Assistance Provided By Virginia Tech

Tenured senior faculty members were utilized for essentially all of the technical assistance provided to the AED Project by Virginia Tech (Table 2). The University promised and delivered the most highly qualified senior scientists to assist with the project in Sri Lanka and to serve as faculty advisors to the training participants.

A. Long-Term:

Dr. James Deegan, Rural Sociologist, served twenty-four months on the AED Project at the PGIA.

B. Short-Term:

Nineteen Virginia Tech faculty members served as short-term advisors on the project in Sri Lanka (Table 2). All of these faculty members think that their special assignments in Sri Lanka were productive, stimulating and enlightening.

Teaching, research and extension programs at Virginia Tech have been enriched by the insights and knowledge gained by these scholars working on the AED Project.

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IV. Additional Contributions Provided To Assist Sri Lanka Government and University of Peradeniya

Several examples of special financial assistance provided by Virginia Tech to build long-term linkages between the University of Peradeniya and Virginia Tech are:

(1) Sabbaticals: (\$40,000 U.S.)

Dr. Jogaratnam -- twelve months at Virginia Tech in Agriculture Economics Department

Dr. Rajamahendran -- nine months at Virginia Tech in Dairy Science Department

(2) Payment of Tuition & Fees for Non-Project Sri Lanka Students:

Names of Students:

C. D. Poornampillai
J. Giridharan
J. O. Obahayijie
Zeena Ishie
Nimal Perera
W. V. Jayasena
D. N. Jayatissa
S. Logendra

(3) Teaching Assignment for Dr. R. O. Thattil at Virginia Tech in Summer of 1986 and his overseas transportation.

(4) Funding of lodging and meals for first two nights upon arrival at Virginia Tech for all project training participants.

V. Lessons Learned On AED Project

Several significant lessons were learned on this successful Agricultural Education Development Project including:

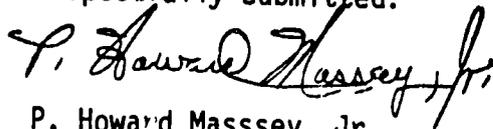
(1) the importance of involving key host country government and university officials in planning and implementing the project.

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- (2) the importance of careful selection of the prime contractor, the universities, project managers, faculty providing technical assistance, and training participants.
- (3) the importance of participant trainees conducting their thesis research in their home country on problems relevant to the needs of their country.
- (4) the importance of annual meetings involving key project managers (chief-of-party, host country university, AID mission, prime contractor, university coordinators and university deans) in host country and in U.S.A. on alternate years. This excellent project procedure has assured better understanding of project objectives and limitations, and enabled problem resolution before major bottlenecks developed.

In summary, the AED Project has largely achieved the major goals envisioned, planned and implemented by the Government of Sri Lanka and the Agency for International Development. The Postgraduate Institute of Agriculture, University of Peradeniya, has now developed into a competent agricultural teaching and research training center for Sri Lanka and Southeast Asia.

Respectfully Submitted:



P. Howard Massey, Jr.
Virginia Tech Campus Coordinator
for Agricultural Educational
Development Project

Attachments



**Table 1. Participant Training Conducted at Virginia Tech
Virginia Polytechnic Institute & State University (Virginia Tech)**

A. Long-Term:

<u>Name</u>	<u>Department</u>
R. Mills	Agriculture Engineering (Did not complete)
S. Panditharatne	Animal Science
V. Ravindran	Animal Science
K. Nadarajah	Animal Science
K. Perera	Dairy Science
K. Navaratnam	Agriculture Education/Ext.
A. Jayasekera	Agriculture Engineering
S. Zuhair	Agriculture Economics/Ext.
S. Jeyanayagam	Agriculture Engineering
N. Jayatissa	Agriculture Engineering
R. Thattil	Statistics
K. Goonasekera	Agriculture Engineering
G. Ravindran	Food Science & Technology

B. Short-Term:

<u>Name</u>	
R. S. Rajapakse	(Registrar -- 2 months)
S. B. Wijerathne	(Hydrology -- 2 months)
K.M.S. Banda	(Da. Sci., An. Sci., Food Sci. -- 3 months)
Neil Perera	(Communications -- 3 months)

Table 2. Technical Assistance Provided By Virginia Tech

	<u>Person Months Worked</u>
Long-Term (one year or more):	
Rural Sociology -- James Deegan	
Total Long-Term Personnel	24.0
Short-Term (less than one year)	
Civil Engineering -- Paul Kirshen	1.0
Animal Physiology -- Frank Gwazdauskas	3.0
Monogastic Nutrition -- E. T. Kornegay	1.8
Entomology -- Michael Kosztarab and Robert Pienkowski	3.0
Animal Breeding -- Tom Marlowe	3.3
Agrostology -- Vivien Allen and Roy E. Blaser	3.3
Agric. Waste Management -- Eldridge Collins	2.6
Ruminant Nutrition -- Joseph P. Fontenot	2.3
Agricultural Administration -- C. Gene Haugh	1.2
Soil/Water Management -- John Perumpral	3.0
Food Science -- Jim Palmer	3.1
Water Management -- John Perumpral	2.0
Statistics -- Abbas Omran	3.0
Agriculture Economics -- Randy Kramer	1.0
Inland Fisheries -- Louis A. Helfrich	3.0
Meats Processor -- Robert F. Kelly	2.0
Agriculture Engineering -- John Wiersma	<u>4.0</u>
Total Short-term personnel	42.6
Total Off-Campus personnel	66.6
<u>On-Campus Personnel</u>	
Campus Coordinator -- F. Howard Massey, Jr.	
Administrative Assistant -- Peggy Hall	

ANNEX 4

**AED Project Final Status Report
September 1986**



CONSORTIUM FOR INTERNATIONAL
AGRICULTURAL EDUCATION
DEVELOPMENT

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

SRI LANKA
AGRICULTURAL EDUCATION DEVELOPMENT
Final Project Status Report

September 15, 1986

**This report was prepared under Contract No. AID/ASIA-C-1397
for Technical Services to Project 383-0049
for Agricultural Education Development, Sri Lanka**

Field Office: Agricultural Education Development Project, Postgraduate Institute of Agriculture,
The University of Peradeniya, Peradeniya, Sri Lanka Telephone: (08) 88203

Home Office: 1255 Twenty-third Street, N.W., Washington, D.C. 20037
Telephone: (202) 882-1900 Telex: ACADED WSH 88880 Cable: ACADED WASHINGTON, D.C.

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TRAINING

From Contract No. AID/ASIA-C-1397:

38 junior staff to be trained to the Ph.D. level

Accomplishments:

Long-term Participants					
<u>Year</u>	<u>Entered Training</u>	<u>Completed Ph.D.</u>	<u>Only MS</u>	<u>Dropped</u>	<u>In Training</u>
1979	10				10
1980	18				28
1981	10	1			37
1982		2	1	1	33
1983	1	4			30
1984		1		2	27
1985		8		2	17
1986		10	1		6
Total	39	26	2	5	

Short-term Participants

	<u>Actual</u>
Assistant Librarian (Penn State, 1984)	3.0
Hydrology (Virginia Tech, 1986)	3.0
Instructional Systems (Virginia Tech, 1986)	3.0
Assistant Registrar (Virginia Tech, 1986)	2.0
Animal Science (Virginia Tech, 1986)	3.0

Total Technician Training by PACD 14.0 p.m.

Total Training by PACD

Participants trained to Ph.D.	26
Participants trained to M.S.	2
Short-term trainees	5
Participants still in training after PACD	6
No. dropped before completing Ph. D. degree	5

PARTICIPANT STATUS REPORT
September 15, 1986

CONTRACT NO.AID/ASIA-C-1397
Agricultural Education Development Project/Sri Lanka

LONG-TERM PARTICIPANTS

	<u>Degree</u>	<u>Field</u>
The Pennsylvania State University		
Bandara, D.	Ph.D.	Crop Physiology
Jayatilaka, M.	Ph.D.	Rural Sociology
Kailasapathy, K.	Ph.D.	Agricultural Chemistry
Perera, A.	Ph.D.	Agro-forestry
Perera, L.	Ph.D.	Weed Science
Peiris, Colin	Ph.D.	Seed Physiology
Ranamukaraachchi, S.	Ph.D.	Crop Systems
Sriskantha, A.	Ph.D.	Virology
Sumanasinghe, V.	Ph.D.	Systematic Botany
Wickremasuriya, A.	Ph.D.	Agricultural Education
Yapa, L.	Ph.D.	Soil Physics
Texas A & M University		
Bogahawatte, C.	Ph.D.	Agricultural Economics
Dayawathie, B.	Ph.D.	Entomology
Fernandez, G.	Ph.D.	Pulse Breeding
Jegasothy, K.	Ph.D.	Agricultural Economics
Piyasena, A.	Ph.D.	Agricultural Economics
Prathapar, S.	Ph.D.	Soil/Water Conservation
Puvirajasinghe, P.	Ph.D.	Agroclimatology
Sivayoganathan, C.	Ph.D.	Communications
Wickremasinghe, P.	M.S.	Plant Breeding
Virginia Polytechnic Institute and State University		
Goonasekera, K.	Ph.D.	Hydrology
Panditharatne, S.	Ph.D.	Agrostology
Perera, K.	Ph.D.	Animal Physiology
Ravindran, G.	Ph.D.	Food Science
Ravindran, V.	Ph.D.	Animal Nutrition
Thattil, R.	Ph.D.	Biometry
Zuhair, S.	Ph.D.	Agricultural Economics
Jayatissa, D.	M.S.	Agricultural Engineering

SHORT-TERM TRAINEES

The Pennsylvania State University

Muddanayake, I.

Field

Library

Virginia Polytechnic Institute and State University

Perera, Neil C.
Rajapakse, R.S.
Wijeratne, S.
Banda, K.

Instructional Systems
Assistant Registrar
Hydrology
Animal Science

WILL COMPLETE TRAINING AFTER PACD

	<u>Expected Completion</u>	<u>Field</u>
The Pennsylvania State University		
Chanmugathas, P. 149020	86/12/31	Soil Micro-biology
Pararajasingham, S. 501002	86/11/15	Stress Physiology
Texas A & M University		
Ariyaratne, A. 146719	86/12/31	Farm Machinery
Rajapakse, Nihal 501004	86/11/15	Post Harvest Physiology
Rajapakse, Sriyani 501003	86/11/15	Horticulture
Virginia Polytechnic Institute and State University, Utah		
Jayasekera, A. 501231	86/12/31	Water Management

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TECHNICAL ASSISTANCE

From Contract No. AID/ASIA-C-1397:

Approx. 22 p. yrs. (269 p. ms.)

As per Amendment No. 6:

Approx. 20 p. yrs. (238 ms.)

		<u>p. ms.</u>	<u>Required</u>
A.	Chief of Party		
	H. Ray (4/79-6/79) in D.C.	3.00	
	H. Ray (7/79-11/82) in S.L.	41.00	
	S. Martin (12/82-12/85) in S.L.	37.00	
		81.00 p.m.	74.30 p.m.
B.	Long Term Advisors		
	Downs (79-80)	13.00	
	Deegan (1/80-2/82)	25.00	
	Omran (81-83)	29.00	
		67.00 p.m.	61.00 p.m.
C.	Short Term Advisors		
	1979	15.50	
	1980	20.50	
	Additional: 12 days*	0.60	
	1981	9.00	
	1982	8.00	
	Additional: 34.3 days*	1.22	
	1983	7.25	
	1984	8.90	
	1985	13.25	
	1986 (through 9/15/86)	6.75	
	Additional: 33 days*	1.50	
		92.47 p.m.	102.60 p.m.
	TOTAL DELIVERED BY PACD	<u>240.47 p.m.</u>	<u>237.90 p.m.</u>

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Additional Technical Assistance:

	<u>p. ms.</u>	<u>Required</u>
A. Technical Training (using T.A. funds)	14.00 p.ms.	-0-
B. T.A. provided by U.S. Universities using non-project funds	4.0 p.ms.	-0-
Subtotal	<u>18.0 p.ms.</u>	<u> </u>
TOTAL TECHNICAL ASSISTANCE PROVIDED	267.00 p.m.	237.90 p.m.

*** Additions mentioned in C., previous page:**

- Miller - 2 days (1980)
- Thornton - 10 days (1980)
- McCord - 2 days (1982)
- Mason - 2.3 days (1982)
- H. Ray - 30 days (1982)
- Martin - 33 days (1/86 - 5/86)

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EQUIPMENT

From Contract No. AID/ASIA-C- 1397: (including shipping and associated costs)^a

Original contract (incl. inflation factor)	\$ 969,229.00
As per Amendment No. 6	\$ 967,445.00 ^b
As revised to conform with Project Grant Agreement Amendment	\$1,100,229.00
As revised August 20, 1985, increased to within 15 percent of line item flexibility limit	\$1,120,000.00 ^b
As revised March 17, 1986, reflecting Library acquisition increase	\$1,045,000.00 ^b

Progress to date:

Equipment procured	\$1,143,796.00 ^c
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(Includes equipment purchased through FETCO, locally purchased xerox, computer, etc., and video and rice milling equipment purchased in Japan.)

Equipment purchased by participants	\$45,000.00 ^d
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Projected by PACD

All equipment has been procured and will be delivered to the PGIA/FA by PACD.

^a Equipment component identified in terms of dollar value only.

	<u>Est. in 1984</u>	<u>Est. in 1985</u>	<u>Est. in 1986</u>
^b Obtained by subtraction			
Line item 8 in Amend. 6	1,452,445.00	1,620,000.00	1,575,000.00
Less Vehicles	110,000.00	110,000.00	110,000.00
Less Library acquisition	375,000.00	390,000.00	420,000.00
	\$ 967,445.00	\$1,120,000.00	\$1,045,000.00

^c Funds beyond amount previously budgeted (\$1,045,000) were available due to reallocation in budget line items.

^d Purchases of equipment by participants came out of research/computer funds.

**List of Equipment Purchased by Participants
Attending Virginia Polytechnic Institute & State University
(as submitted by University)**

Name	Item	Amount
Banda, K. M. S.	Camera w/accessories	\$ 180.55
	Sharp calculator	89.95
Goonasekere, K	ZX81 Microcomputer kit	\$ 99.00
	Ultrasonic ranging system	
	designer's kit	150.00
	Gurley pygmy type current meter outfit	752.99
	HP33E calculator	84.24
	Calculator	215.76
Jayasekera, A.	Calculator	\$ 299.47
	24mm lens for SLR camera	132.40
	IBM PC and accessories	1,545.00
Jayatissa, N.	Tape player w/access.	\$ 49.95
	AC adapter	11.90
	cassette tapes	11.16
	cable	19.95
	battery	5.98
	HP-15 C calculator	108.50
	Parker subplate	30.36
	Parker valve	145.59
	Hydraflex valve	81.20
	Parker bolt kit	3.11
	Parker sub-plate	25.53
	C & C cylinder	161.98
	5K Clare stat	35.60
	Pillow blocks	54.32
	Misc. - switch, charger wrap tool, plugs printer cable	49.09
	Misc. - socket head screens, adapters, hose fitting	98.76
	Misc. - adapters, caps, fittings	65.27
	FHP sheave & bushing	11.49
	dip switch, plug pin receptacle pin & cable clamps	145.44
	Steel rod	199.33

Virginia Tech--Purchases by Participants (continued)

Name	Item	Amount
Jayatissa, N. (cont.)	Sp rocket, chain & links	68.47
	100 portable Radio Shack computer	599.00
	Ram upgrade	134.95
	Stevens-Arnold power supply	233.61
	Datel 8 channel converter	396.63
	Signal conditioner	\$ 133.46
	Pressure reducing valve	265.00
	P/H check valve	20.10
	Misc. - sockets pinseals terminal strip, wire wrap, extraction tool	137.28
	Turbo pascal for IBM PC	39.90
	Calculator	80.35
Jeyanayagam, S.	Gas apparatus	\$ 538.89
	Metric calculator	38.34
	High intensity lamp	28.40
	Calculator	80.00
Mills, R.	Calculator	\$ 80.00
Nadarajah, K.	Calculator	\$ 264.93
Navaratnam, K.K.	Calculator	\$ 243.43
	Camera w/case	
	Portable recorders (2)	
Panditharatne, S.	Typewriter	\$ 259.00
	Calculator	80.00
Perera, K.	HP battery pack	\$ 43.50
	Progesterone CAC Kit (3 ea.)	1890.00
	Hygrothermograph	335.00
	Digital pipet 1-10ULE	119.50
	Digital pipet 10-100ULE	119.50
	Digital pipet 100-1000ULE	119.50
	TI-58C calculator	80.00
Ravindran, G.	Calculator	\$ 80.00
	Calculator	199.96
Ravindran, V.	Calculator	\$ 300.00

Virginia Tech--Purchases by Participants (continued)

Name	Item	Amount
Thattil, R.O.	Calculator	\$ 271.00
Wijeratne, S.B.	Canon camera w/flash	\$ 147.63
Zuhair, S.M.M.	IBM portable PC	\$1545.00
	IBM proprinter	375.00
	Parallel port	230.00
	Diskettes	64.00
	Printer cable	47.50
	Calculator	200.00

**List of Equipment Purchased by Participants
Attending Pennsylvania State University
(as submitted by University)**

Name	Item	Amount
Bandara, D.	IBM PC computer and monitor	\$1,222.00
	Epson LX80 printer	280.00
	Printer cable	32.00
	Communications adapter	70.00
	Printer adapter	53.00
	DOS 3.2 operating system	60.00
	Lotus 1, 2, 3	235.00
		Rs 450.00 Rs 215.00
Chanmugathas, P.	IBM PC computer	\$1222.00
	Lotus 1, 2, 3	235.00
	Epson printer	946.00
	Graphics board and cable	412.00
Jayatilaka, W.	SPSS/PC software	\$ 635.00 Rs 4,775.50
Pararajasingham, S.	IBM PC computer	\$1222.00
	IBM proprinter	346.00
Peiris, C.	PH meter, model 800	\$ 482.00
	Centrifuge	317.00
	Vacuum cleaner	90.00
	Poly foil poly bags	444.00
	Transformer	51.00
	33 boxes of lab equipment	donated
	Canon zoom lens	84.00
	Platinizing solution	74.00
	Pipetman 20	160.00
	Pipette pump	7.00
	various chemicals	1012.00
Perera, A.	Forestry supplies	\$ 800.00
	Geiger, forestry supplies	272.00
	IBM PC computer	1020.00
	IBM PC printer adapter	51.00
	Epson LX80 printer	250.00
	SYSTAT software	396.00
	printer cable	25.00
	Tractor unit for printer	35.00

University of Pennsylvania -- Purchases by Participants (continued)

Name	Item	Amount
Sumanasinghe, V.A.D.	Power generator, model EC458	\$ 706.00
	IBM PC computer, model 5155, and software	1300.00
	Epson LX80 printer	245.00
	Diskettes	52.00
	Ribbons	32.00
	Chemicals	396.00
	Electrostarch	261.25
Wickramasuriya, H.	IBM PC computer	\$1465.00
	DOS 2.1 operating system,	46.00
	MINITAB software	100.00
	LX80 ribbons	24.00
	Printer adapter	53.00
	Epson LX80 printer	245.00
	Epson LX80 printer cable	25.00
	Diskettes	103.00
	Calculator	Rs 960.00
	Torches (2)	90.00
	Water Puncher (2)	22.50
	Stamp pad	27.50
	Date stamp	18.75
	Scissors	25.00
	Stapling machine	45.00
	Stylus pen	35.00
	Ruling pen	35.00
	Writing & drawing sheet	120.00
	Four-hole punch, No. 848	575.00
	Cellotape cutter	25.00
	Stapler remover	17.50
	Clip tray	44.00
	Paper cutter	1400.00
	Foot pump	225.00
	TDK cassettes D90 (10)	330.00
	Philips cassettes (10)	380.00
	Multi plug	27.50
	Cassette recorder, Sanyo	1550.00
	Ear plug	7.50
	Lamp, kerosene	25.00
	Bicycle, Yagami	2700.00
	Bicycle bell	25.00
Mosquito net	160.00	
Double bed	100.00	
1" survey maps (4)	152.00	

**List of Equipment Purchased by Participants
Attending Texas A & M University
(as submitted by University)**

Name	Item	Amount
Ariyaratne	Data aquisition system	\$1340.90
	printer	319.00
	Interface for printer	129.95
	Solar collector, solar control pumps, water-to-air heat exchanger WF-16, air vent valve; temperature and pressure relief	1200.00
	General Interface for Apple	891.50
	Quick disconnect thermocouple compression fitting, connectors, extension wire	539.51
Dayawathie	Dram vials, cult tube, stage micrometer battery, eyepiece micrometer	\$ 374.92
	Fiberglass, screen wire	178.92
Piyasena	Calculator	Rs 6.66
Prathapar	Lettering system	\$ 260.00
	IBM PC	
	system unit	
	keyboard	
	memory	
	two drives	1560.00
	monochrome drive	187.00
	display and printer adapter	170.00
	math co-processor option	156.00
	DOS	45.00
	Proprinter	384.00
Printer cable	30.00	
Diskettes	130.60	
Puvirajasinghe	chemicals	\$ 313.24
	Leaf press	380.47
Rajapakse, N.	Plan water status console	\$1699.00
	Hose 67.70	
	Sealing sleeve	5.01
	Support washer	3.23
	Four sealing grommets	29.80
	Thermocouple hygro/psychrometer	445.15

Texas A&M—Purchases by Participants

Name	Item	Amount
Rajapakse, S.	Sieve brass Six inch membrane, filter assembly, six tube pumps, two filter assembly sets	\$ 177.93 314.22

VEHICLES

From Contract No. AID/ASIA-C-1397:

Ten jeeps (diesel, 4-wheel drive), seven trail bikes, two minibuses, two diesel buses, one pick-up truck, and one 2-3 ton stake truck.^a

As per Amendment No. 6:

10 jeeps

Total Delivered by PACD

10 jeeps procured and in service in Sri Lanka	\$110,000
---	-----------

^a All but the jeeps subsequently were deleted to conform with the terms of the Project Grant Agreement.

LIBRARY DEVELOPMENT

From Contract No. AID/ASIA-C-1397:

	<u>No.</u>
Journals	165
Books	18,000
Micro	90

As understood from Project Grant Agreement Amendment:

Journals	60-64
Books	8-10,000
Micro	90

TOTAL DELIVERED BY PACD:

		<u>Cost</u>
Journal/periodical subscriptions	63	\$62,000
Books purchased*	9,447	345,500
Micro (volumes)	952	2,500
Last book shipment		10,000
		<u>\$410,000</u>

NOTE: Above do not include donations of books and journals received from CAED universities and individuals.

*Including shipping costs

EXPIRATION DATES FOR JOURNALS

Agricultural Education Development Project/Sri Lanka

1986	December*	3
1987	March	1
	July	1
	December	28
1988	July	2
	December	18
1989	December	3
1990	December	3
1993	December	1
1994	August	1
	December	3
TOTAL PUBLICATIONS		63

* Publishers contacted re extension of subscriptions but no reply received to date.

Table IV
PGIA/FA Library Periodicals Obtained
by Date of Subscription Expiration

Title	Exp. Date	Title	Exp. Date
1. Agriculture Engineering	12/88	33. Environmental Entomology	12/87
2. Agronomy Journal	12/87	34. Experimental Mycology	12/87
3. Am. Entomological Soc. Transactions	12/94	35. Extension Review	06/87
4. Am. Journ. of Ag. Econ.	12/87	36. Farm Chemicals	12/87
5. Annual Rev. of Biochemistry	12/88	37. Foreign Agriculture	06/87
6. Annual Rev. of Ecology & Systematics	12/88	38. Genetics	12/87
7. Annual Rev. of Entomology	12/88	39. Human Comm. Res.	12/94
8. Annual Rev. of Genotics	12/88	40. Journ. Ag. & Food Chemistry	12/87
9. Annual Rev. of Immunology	12/88	41. Journ. of Animal Science	12/87
10. Annual Rev. of Microbiology	12/88	42. Journ. of Dairy Science	12/87
11. Annual Rev. of Nutrition	12/88	43. Jour. of Eco. Entomology	12/87
12. Annual Rev. of Physiology	12/88	44. Jour. of Gen. Physiology	12/87
13. Annual Rev. of Phytopathology	12/88	45. Jour. of Heredity	12/90
14. Annual Rev. of Plant Physiology	12/88	46. Journ. of Soil & Water Cons.	12/93
15. Annual Rev. of Sociology	12/88	47. Journ. of Virology	12/87
16. Applied & Envi. Microbiology	12/87	48. Land Economics	12/90
17. Biblio. of Ag. - Monthly	12/89	49. Microbiological Reviews	12/87
18. Biblio. of Ag. - Annual	12/89	50. Mosquito News	12/94
19. Biological Abstracts	12/88	51. Mycologia	12/87
20. Biol. Abstracts - Index	12/88	52. Nature	12/86
21. Biometrics	12/89	53. Pesticide Biochem.& Physiology	12/87
22. Biotropica	12/94	54. Phytopathology	12/88
23. Cell	12/87	55. Plant Disease	12/88
24. General Chemistry	12/88	56. Publisher's Weekly Record	06/88
25. Crops and Soils	06/88	57. Science	12/87
26. Crop Science	12/87	58. Soil & Water Conservation News	12/87
27. Current Con. - Ag. Bio. & Envir. Sc.	12/90	59. Soil Biology & Biochemistry	12/86
28. Dev. Biology	12/87	60. Soil Science	12/86
29. Ecological Monograph	12/87	61. Soil Sc. Society of Am. Journal	12/87
30. Ecology	12/87	62. Transactions of Am. Soc.	
31. Economic Botany	12/87	of Ag. Engineering	12/88
32. Entomology Soc. of Am. Annuals	12/87	63. Weed Science	12/87

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ANNEX 5

**Postgraduate Institute of Agriculture
1985 Annual Report**



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ශ්‍රී ලංකාවේ පේරාදෙණි විශ්වවිද්‍යාලය

உயர் பட்டங்களுக்கான கமத்தொழிற் கல்வி நிறுவகம்
இலங்கைப் பேராதனை பல்கலைக் கழகம்

POSTGRADUATE INSTITUTE OF AGRICULTURE
University of Peradeniya Sri Lanka

දුරකථනය
தொலைபேசி
Telephone

Director 8318
Senior Asst. Registrar 8219
AED Project 8203

පරණ ගලහ මාර, පේරාදෙණිය
பழைய கலஹா பாறை, பேராதனை
Old Galaha Road, Peradeniya

දිනය }
திகதி } September 19, 1986
Date }

COMPARATIVE ANALYSIS - 1978 and 1986

FROM : Professor Y. D. A. Senanayake
Director, PGIA
RE : AED Project Final Report.

Senanayake

	1978	1986
1. <u>Visiting staff</u> - Number of Ph.D's in teaching panels of Boards of Study	73*	62
Ratio of teachers to students	1:1 (73:74)	1:3 (62:195)
* Although many staff were identified predominantly from institutions outside the university, the numbers taking classes were smaller.		
2. <u>Curriculum</u> - Courses offered in field of study:		
Crop Science	17	21
Agricultural Biology	40	41
Agricultural Chemistry	40	40
Agricultural Economics and Ext.	26	38
Animal Science	30	30
Agricultural Engineering	31	27
Common courses	05	07
	<u>189</u>	<u>204</u>

- Special non-degree training programs taught over the last seven years: Nil (due to inadequacy of staff).

Short course : Use of Computer in Agricultural Research in 1986.

- New departments and Boards of Study developed over the past seven years: Nil.

But two new Boards (Soil Science and Food Science and Technology) was approved by the UGC this month. They will begin functioning from October 1986).

3. Funds for research - 1978 - Rs. 40,900
 1986 - Rs. 758,340)
 Rs. 1,045,132) Rs. 1,803,472.00

4. Facilities - Amount of space devoted to classroom, laboratory, administration and etc. in 1978 and 1986:

	1978	1986	
Classroom	nil	Sq.ft. 880	(In addition all the classrooms in the Faculty of Agriculture also are being used).
Auditorium	nil	Sq.ft. 1,204	
Administration	nil	Sq.ft. 1,756	
Computer	nil	Sq.ft. 700	

5. Equipment Value -

1978	Office equipment	Rs. 78,639.00	
	Teaching equipment	Rs. 285,851.06	
			Rs. 364,490.06
1986	Office equipment	Rs. 468,464.00	
	Teaching equipment	Rs. 741,661.00	
	US aid	Rs. 25,948,854.00	
			Rs. <u>27,158,979.00</u>

6. Library -

	1978	1986
Books	10,000	25,000
Journals	60	170
Microfiche	0	125
Microfilm	0	50

7. International -

- Cooperative relationships with international organizations:

1978 - SEARCA (Philippines)

1986 - SEARCA (Philippines), IDRC (Canada), World Bank, UNICEF, Rockefeller, Netherlands Govt., British Council, ODA (U.K.), IFS (Sweden), IRRI (Philippines), ICRISAT (India), USAID

- Cooperative relationships with other academic institutions:

1978 - nil.

1986 - Pennsylvania State University, Texas A and M University, Virginia Polytechnic and State University, Clark University, University of Southampton.

Under the Diversified Agricultural Research Project (DARP) 30 scholars of the Department of Agriculture will enter different universities in USA during 1986/1987 for course work in a split program training for M.Phil. and Ph.D. degrees. About 10 are presently in USA. Placement of students are done by the Institute of International Education, New York.



POSTGRADUATE INSTITUTE
OF
AGRICULTURE

DIRECTOR'S REPORT
FOR THE YEAR
1985.

POSTGRADUATE INSTITUTE OF AGRICULTURE

ANNUAL REPORT 1965

General

The Institute completed its first ten years during the year. Emphasis continued on the improvement of the three postgraduate degree programmes, namely, the M.Sc, M.Phil and Ph.D degrees. Together with the graduating group in 1965, the numbers that have graduated during the 10 year period under the three degree programmes are 157 (M.Sc), 55 (M.Phil) and 13 (Ph.D). During the year 15 (M.Sc) and 8 (M.Phil) candidates completed their programmes. The Postgraduate Diploma Course in Food and Nutrition Planning continued for the second year.

Students Admissions

The number of admissions and registrants improved from the previous year. The number admitted increased from 84 in the previous year to 98 and the number registered from 50 to 56. There is still a wide gap between the numbers admitted and registered for the three degree programmes. Together with the casual students, provisional students and the Diploma students there were 69 new registrants (Table 1). When

the continuing students are included there were 195 registered in all programmes of which about 50 percent were for M.Phil degrees (Table 2).

External Assistance

1. USAID Assistance

The Agricultural Education Development Project (AED) funded by USAID and implemented through the Institute by the prime contractor, the Academy for Educational Development in Washington, continued its activities during the year. In staff development, 8 members of the academic Staff completing their Ph.D degrees and 7 returned to the University. Seventeen others were continuing the Ph.D programme abroad after having completed their M.Sc degrees. Three members who completed their Ph.D degrees did not return to the University. On technical assistance the Chief of Party of the project completed his assignment at the end of the year. In addition 14 - 25 person months of service of short term advisors were also made available by the three project Universities, Pennsylvania State University, Texas A & M University and the Virginia Polytechnic and State University. Laboratory and farm equipment and library acquisitions worth Rs.3.7 million was also provided making the total project

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acquisitions so far to reach about US \$ one million. The library acquisitions under the project included continuing subscriptions to 65 journals and purchase of 3543 books.

2. ODA Assistance

The ODA studentship programme continued during the year and six more studentships were awarded in 1985. Almost all the previous scholars who completed their programmes have been employed principally in the government sector. Dr. Frank Bolton continued as full-time Co-ordinator from Peradeniya and provided considerable technical assistance to the scholars during their research phase.

3. Other Foreign Assistance

Studentships which were initiated by several foreign agencies in previous years' were either completed or continuing during the year. These included support from DANIDA, NORAD, FAO, IDRC, SIDA.

4. Local Assistance

Among local institutions and agencies the International Winged Bean Institute, the Ministry of Agricultural Development and Research, the Ministry

of Plantation Industries and the Department of Minor Export Crops continued their support for research.

Library Development

The probationary Assistant Librarian commenced her postgraduate training in library science at the University of Philippines under a scholarship sponsored by the International Research Development Center, Canada. During the year 4613 books, 190 micros, and 166 journals were acquired to the Agriculture library. Together with the book acquisitions for the year the library now has about 25000 books. The present library is congested. Detailed architectural plans to construct a new library was completed by the Buildings Department.

The Postgraduate Institute of Agriculture Fund

A full statement of accounts for the financial year 1985 prepared in terms of Section 106 (1) (2) and 107 (b) of the Universities Act No.16 of 1978 as amended by the Universities (amendment) Act No.7 of 1985 and in terms of Finance Act No.38 of 1971 is submitted separately.

Appreciation

As in previous years the PGIA continued to receive the support and co-operation of several institutions. We wish to record the research support given by the Ministries of Agricultural Development and Research, Plantation Industries, the Departments of Agriculture and Minor Export Crops and the ODA (UK) through the British Council. Our appreciation is also due to the staff of the Agricultural Education Development Project located at the PGIA and Washington D.C., the Consortium Universities, the USAID (Colombo) and FAO (Colombo) for their advice and support to improve our programmes. The support of the University Grants Commission, the Vice-Chancellor and administrative staff of the University of Peradeniya and the assistance of the Institute's own staff are gratefully acknowledged. The academic programmes of the Institute continued to function well due to the prompt co-operation received by the Boards of Studies. To them and particularly to the efficient assistance of their Secretaries we wish to record our appreciation.

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TABLE 1

1. Admissions, Registration and Postgraduate Degrees
Granted in 1985

Degree	No.admitted	No.registered	No.of degrees granted
M.Sc	40	22	15
M.Phil	51	29	08
Ph.D	07	05	00
Total	98	56	23
Casual Students	05	05	-
Provisional Students	02	02	-
Diploma in Food and Nutrition	06	06	-
Total	111	69	23

.....

TABLE 2

Postgraduate Degrees Granted to date by each Postgraduate
Institute of Agriculture Board of Study, and 1985/86
Registrations

Degrees	Granted	Agric. Bio.	Agric. Chem.	Agric. Econ.	Agric. Eng.	Animal Scie.	Crop Scie.	Total
<u>M.Sc.</u>	Prior	27	15	42	13	26	19	142
	1985	<u>01</u>	<u>03</u>	<u>04</u>	<u>02</u>	<u>04</u>	<u>01</u>	<u>15</u>
	Total to date	<u>28</u>	<u>18</u>	<u>46</u>	<u>15</u>	<u>30</u>	<u>20</u>	<u>157</u>
<u>M.Phil.</u>	Prior	22	05	00	06	04	10	47
	1985	<u>01</u>	<u>00</u>	<u>02</u>	<u>01</u>	<u>01</u>	<u>03</u>	<u>08</u>
	Total to date	<u>23</u>	<u>05</u>	<u>02</u>	<u>07</u>	<u>05</u>	<u>13</u>	<u>55</u>
<u>Ph.D.</u>	Prior	04	01	02	00	00	06	13
	1985	<u>00</u>	<u>00</u>	<u>00</u>	<u>00</u>	<u>00</u>	<u>00</u>	<u>00</u>
	Total to date	<u>04</u>	<u>01</u>	<u>02</u>	<u>00</u>	<u>00</u>	<u>06</u>	<u>13</u>
<hr/>								
<u>Total all Degree Granted</u>								
	Prior	53	21	44	19	30	35	202
	1985	<u>02</u>	<u>03</u>	<u>06</u>	<u>03</u>	<u>05</u>	<u>04</u>	<u>23</u>
	Total to date	<u>55</u>	<u>24</u>	<u>50</u>	<u>22</u>	<u>35</u>	<u>39</u>	<u>225</u>
<hr/>								
<u>Number currently registered</u>								
M.S.		03	11	11	13	05	08	51
M.Phil.		21	14	31	16	06	22	110
Ph.D.		05	00	06	01	01	05	18
Casual		02	00	04	01	01	00	08
Provisional		00	00	02	00	00	00	02
Diploma Course		<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>06</u>
	Total	<u>31</u>	<u>25</u>	<u>54</u>	<u>31</u>	<u>13</u>	<u>35</u>	<u>195</u>

APPENDIX I

Admission for 1985 by Boards of Study

<u>Board of Study</u>	<u>M.Sc.</u>		<u>M.Phil</u>		<u>Ph.D.</u>		<u>Casual</u>	<u>Provisi- onal</u>	<u>Total</u>
	<u>Full Time</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Full Time</u>	<u>Part Time</u>				
Agric. Bio.	05	04	00	01	01	00	00	11	
Agric. Chem.	17	00	00	00	00	00	00	17	
Agric. Econ.	06	05	06	02	01	04	02	26	
Agric. Eng.	03	08	05	00	01	01	00	18	
Animal Science	05	02	00	00	00	00	00	07	
Crop Science	<u>04</u>	<u>19</u>	<u>02</u>	<u>00</u>	<u>01</u>	<u>00</u>	<u>00</u>	<u>26</u>	
	40	38	13	03	04	05	02	105	
Diploma Course in Food and Nutrition	<u>00</u>	<u>00</u>	<u>00</u>	<u>00</u>	<u>00</u>	<u>00</u>	<u>00</u>	<u>06</u>	
Total	<u>40</u>	<u>38</u>	<u>13</u>	<u>03</u>	<u>04</u>	<u>05</u>	<u>02</u>	<u>111</u>	

Student Registered by Boards of Study

APPENDIX II

	<u>M.Sc.</u>		<u>M.Phil</u>		<u>Ph.D</u>		<u>Casual</u>	<u>Provisi- onal</u>	<u>Total</u>
	<u>Full Time</u>	<u>Full Time</u>	<u>Part Time</u>	<u>Full Time</u>	<u>Part Time</u>				
Agric. Bio.	02	03	00	00	01	00	00	06	
Agric. Chem.	08	00	00	00	00	00	00	08	
Agric. Econ.	04	04	05	01	01	04	02	21	
Agric. Engi.	03	04	04	00	01	01	00	13	
Animal Science	02	01	00	00	00	00	00	03	
Crop Science	<u>03</u>	<u>06</u>	<u>02</u>	<u>00</u>	<u>01</u>	<u>00</u>	<u>00</u>	<u>12</u>	
	22	18	11	01	04	05	02	63	
Diploma Course in Food and Nutrition	<u>00</u>	<u>00</u>	<u>00</u>	<u>00</u>	<u>00</u>	<u>00</u>	<u>00</u>	<u>06</u>	
Total	<u>22</u>	<u>18</u>	<u>11</u>	<u>01</u>	<u>04</u>	<u>05</u>	<u>02</u>	<u>69</u>	

APPENDIX III

Admissions by Nominating Institutions to Degree Course

<u>Institutions</u>	<u>Number Admitted</u>
Private (20 out of these 47 are in the temporary service of the University)	47
Department of Agriculture	8
Department of Education	6
Mahaweli Authority of Sri Lanka	6
Commercial Sector	5
Dept. of Animal Production & Health	3
Universities	3
Dept. of Irrigation	3
Foreign Students	3
Dept. of Minor Export Crops	3
Winged Bean Institute	1
State Plantation Corporation	1
Oils and Fats Corporation	1
Marga Institute	1
Fertilizer Corporation	1
Central Bank of Ceylon	1
Ministry of Home Affairs	1
Livestock Board	1
Tea Research Institute	1
Ministry of Local Govt.	1
Sugarcane Research Institute	<u>1</u>
CASUAL STUDENT - A.R.T.I.	2
Private	3
Provisional Student - Dept. of Education	1
Ministry of Planning	<u>1</u>
	105

Admission by Nominating Institutions to Diploma Course in Food and Nutrition

Ministry of Planning	<u>6</u>
Total	<u>111</u>

Programme Completed

M.Sc. (Agric.)

Mr. G.A. Thaheri
Mr. S. Paramasivam
Mrs. K.G. Wijesuriya
Mr. T.B. Herath
Mr. H.P. Sugathadasa
Miss. S. Gajanayake
Mr. W.A.J.N. Fernando
Mr. M.R. Fernando
Mrs. H.B. Wilen
Mr. P. Sritharan
Mr. S.S.A. Fernando
Mr. N. Sivaratnam
Mr. K. Sivalingam
Mr. D.L.O. Mendis
Mr. A. Hettiarachchi

M.Phil. (Agric.)

Mr. K. Mohanakanthan
Mr. M.A.L.B. Herath
Mr. A. Nagendran
Mr. H. Peiris
Mr. E.M. Balasubramaniam
Mr. N.D.R. Weerawardena
Mr. S. Samarakoon
Mr. J.R. Pooranampillai

RESEARCH IN PROGRESS, BY BOARD OF STUDY

M. PHIL. PROGRAMME

BOARD OF STUDY IN CROP SCIENCE

- | | |
|---------------------------|--|
| Mr. B.W.M.J. Basnayake | Adaptability studies for agronomic parameters and quality traits in Sugarcane. (<u>Saccharum</u> spp.) |
| Mr. D.A.P. Dissanayake | Propagation and productions of Aroids and Dioscorea yams. |
| Mr. P.B. Ekanayake | Soil moisture studies in relation to agronomic practices in young tea growing in mid country. |
| Mrs. S.N. Harischandra | Studies on the morphological, anatomical and biochemical characters of the root and tuber crops, namely Dioscorea (yams) of Sri Lanka. |
| Miss. G.A.S.S. Jeewananda | Development stages of seeds of Winged Bean (<u>Psophocarpus tetragonolobus</u> (L.) DC). |
| Mr. K.G. Prematilake | Sequential arrangement of crops and technical feasibility studies. |
| Mrs. P.V.S.D. Prematilake | Manipulation of growth parameters through cultural practices to increase tuber production in sweet potato. |
| Mr. H.H. Ratnayake | Conservation farming in Mahaweli System "C". |
| Mr. R.G.A.R. Samaranyake | Growth and productivity of intercrop systems of selected winged bean varieties and maize. |

- Mrs. V. Shanmuganathan** Effect of sowing densities on growth and yield of rice in the eastern region.
- Mr. V. Shanmugarajah** Studies on clonal characteristics of tea in relation to climatic and edaphic factors.
- Mr. P.A. Tennakoon** Developing an annual cropping system for Mahaweli System "C" area.
- Mr. W.R.G. Witharama** The effect of agroforestry, on the sustainability of annual crops in Mahaweli System "C".
- BOARD OF STUDY IN AGRICULTURAL BIOLOGY**
- Miss. H. Assefa** Genetic variability study on some cultivars of pepper (Piper nigrum L.).
- Mr. K.A.N.P. Bandara** Investigations of some botanical extracts to evaluate their potential use in the control of bean aphids.
- Miss. D.P.P. De Silva** Studies on cocoa swollen shoot virus (CSSV) in Sri Lanka.
- Mr. M. Dharmadasa** Study of the host plant resistance to stem and capsule borer of Cardamom grown in Sri Lanka.
- Miss. L.D. Galanihe** Investigations of rice pests in Sri Lanka.

- Mrs. A. Gunatilake The efficiency of inoculation for soyabeans and cowpeas in Mahaweli System "C".
- Mr. R.B. Herath Influence of different levels of nitrogen fertilizer on biological nitrogen fixation and yield of winged bean.
- Miss. M.N. Jayalath Comparison of incorporation of organic manure with carbon dioxide enrichment of the environment on nitrogen fixation, growth and yield of Winged Bean (Psophocarpus tetragonolobus (L.) DC).
- Miss. S.R. Kalpage Production of inbred lines of rice and testing predictions.
- Mrs. P.V.S. Siriwardena Improving nitrogen fixation in grain legumes by selected strains of Rhizobia.
- Miss. A. Sooriyakala A study of some quantitative characters in Winged Bean (Psophocarpus tetragonolobus (L.) DC) in the F₂ generation.
- Mrs. V. Velauthapillai Effect of soil mulching on biological nitrogen fixation efficiency and yield of Cowpea varieties.
- Miss. C.H. Wickremaratne Some physiological effects of time of planting and fertilizer application methods on selected varieties of Winged Bean (Psophocarpus tetragonolobus (L.) DC).

BOARD OF STUDY IN AGRICULTURAL CHEMISTRY

- Mrs. M.W. Bandaranayake Nitrogen response of maize in Mahaweli System "C".
- Mrs. S.M. Gajameragedera Changes in biochemical composition of Winged Bean (Psophocarpus tetragonolobus (L.) DC) during seed development with special emphasis on storage and structural polysaccharides.
- Miss. T.V. Gamage Detoxification of aflatoxin in coconut oil.
- Mr. S.G. Kandiah Nitrogen, phosphate and potassium for rice in Mahaweli System "B".
- Miss. K.A.M. Kenderagama Rice soil fertility.
- Miss. C.R. Liyanage Use of solar dehydration as a method of preservation to minimise the loss of home garden crops of fruits and vegetables in the Kandy District.
- Mr. T.M. Nagarasa Selection of suitable Species of Azolla and their nutritional requirement on red yellow latosols of Killinochchi and their use as nitrogenous organic manure.
- Miss. G.M.M.M.A. Seneviratne Effect of potassium on nitrogen use efficiency by Winged Bean.
- Mr. P. Weerasinghe Potassium buffer capacity and the mobility of non-exchangable potassium on the availability of potassium in some of the important rice soils in Sri Lanka.

- Mr. W.W.M.S.U. Wijeratne Quality improvement of
arrack using spices and
maturation.
- Mr. A.K.N. Zoysa Cropping pattern testing.

BOARD OF STUDY IN ANIMAL SCIENCE

- Mr. K. Samarasinghe Use of wild Colacasia corm
meal (Colacasia esculenta
L Schott) as an energy
supplement for poultry.
- Mr. H.D. Leelawardena Factors affecting nutritive
value of rice bran.
- Mr. G.D. Warusevithane Utilization of Winged Bean
as a protein supplement
for ruminants.

BOARD OF STUDY IN AGRICULTURAL ECONOMIC & EXTENSION

- Mr. E.M. Ekanayake World demand for Sri Lanka
Tea - An econometric analysis.
- Mr. K. Jayanthakumaran Economics of scale in
paddy production.
- Mrs. M.A.K.H. Karunaratne Economics of irrigation.
- Mr. A.P. Keerthipala Farming systems and land
management in Mahaweli
Systems "B" and "C".
- Mr. D.M. Muthu Benda Economics of shifting
cultivation.
- Mr. J. Nigel Wheat flour consumption in
Sri Lanka: an econometric
analysis.

- Mr. K. Selvanathan Economics of milk production
in the Nuwara-Eliya District.
- Mr. H.U. Warnakulasooriya Productive efficiency of
peasant farmers of Walapane:
A study in Yatimadura.
- Mr. Jinadasa Wijewardena An identification of
constraints on the possible
use of necessary income in
the traditional small
holding sector in the dry
zone of Sri Lanka.

BOARD OF STUDY IN AGRICULTURAL ENGINEERING

- Mr. W.K.B. Elkaduwa Water balance at Pimburattewa
Scheme of System "B" of
Mahaweli development area.
- Miss. N.K.D.C. De Silva Drought stress and land
management in Mahaweli
Systems "B" and "C".
- Mr. I.D.R. Dharmasiri Design development and
dissemination of a suitable
small scale paddy drier.
- Mr. G.A. Gnanamithran Water balance of the Iranamadu
Tank command area in
Killinochchi District.
- Mr. T.H.H. Miskin Development of a small scale
dehulling machine for Winged
Bean.
- Mr. S. Pathmarajah Characterization of soil
hydraulic properties of the
three associates of Reddish
Brown Earth Soils.
- Mr. J.T.B. Ratnayake Cultivation implements and
harvest mechanisation.

PH.D. PROGRAMME

BOARD OF STUDY IN AGRICULTURAL BIOLOGY

- Mr. J. Jayatilake A case study on control and management of insecticides in vegetable production in Kandy District of Sri Lanka.
- Mrs. P. Ponnampalawanar Studies on genotype and environment interactions in Cowpea.
- Miss. S.M.S.D. Ramanayake Interspecific hybrids in Winged Bean, Psephocarpus tetragonolobus.
- Mrs. I.P. Wickremasinghe Evaluation of genetic diversity of local Winged Bean germplasm.

BOARD OF STUDY IN AGRICULTURAL ECONOMICS & EXTENSION

- Mr. W.A.T.M.A.S. Tennakoon The long term outlook for some of the minor export crops of Sri Lanka.
- Mr. G.A.C. De Silva The decision making process among rice farmers in Sri Lanka.

BOARD OF STUDY IN ANIMAL SCIENCE

- Mr. U. Edirisinghe Livestock - Fish integration.

BOARD OF STUDY IN CROP SCIENCE

- Mr. G. Wadasinghe Study of dry matter production in different tea clones in relation to low-country growing conditions.
- Mr. V. Arulandy Evaluation of pre and post-harvest seed deterioration in soyabean under humid tropical conditions.

DEVELOPMENTS AT THE
POSTGRADUATE INSTITUTE OF AGRICULTURE

Submitted at the Meeting of Secretaries of Ministries

of

Agricultural Development & Research

Coconut Industries

Finance & Planning

Higher Education

Lands & Land Development

Mahaweli Development

Plantation Industries

Plan Implementation

Rural Industrial Development

held at the University Grants Commission

on Saturday 07th June 1986

THE POSTGRADUATE INSTITUTE OF AGRICULTURE

The Postgraduate Institute of Agriculture (PGIA) which was established in 1976 has completed its first 10 years. During this period the Institute was most concerned in developing and strengthening its academic programmes. The Postgraduate academic programmes namely the M.Sc., M.Phil and Ph.D were offered from the time the Institute was established. The M.Sc was predominantly a course degree while the other two were a combination of courses and research leading to a thesis.

Course offerings and curriculum development have been improved on a continuous basis. The PGIA now has a full complement of about 180 courses offered in six Boards of Study. This pool of courses covers the essential ones that are required for training agricultural educationists, scientists and extension agents in a developing country like ours. With the return of more trained staff to the Faculty of Agriculture (FA) and postgraduate qualified scientists to other Institutes the course offering will continue to improve. In addition to the improvement of courses the institute has endeavoured to improve the capabilities of staff, research facilities and the library as summarized below.

Staff for Teaching and Research

The PGIA does not have its own academic, technical and other supporting staff cadres. Nor does it have its own laboratories, workshops and experimental stations to implement its teaching and research programmes. It uses the staff of the University, predominantly the Faculty of Agriculture and other Government Institutions as Visiting Lecturers and also makes use of the facilities at different sites to conduct research. The Institute provides the back up administrative and financial support, provides library facilities and computer accessibility to the students and staff.

During the first few years only 30 percent of the teaching staff came from the FA and the rest from outside. To correct this imbalance the PGIA assisted in the expansion of the academic cadre of the FA and also got the new recruits trained abroad under a USAID Project. By the end of this year the imbalance noted above would be reversed and about 80 academics will be available from the FA for teaching and research supervision and some others will also be available from other institutions for teaching and research supervision.

Research Facilities

The PGIA has also assisted the FA to expand the laboratory facilities, update the equipment and provide essential consumable items for research. In addition, the facilities on the experimental stations under the FA have been improved. The research students also use the experimental facilities of other Government Institutions particularly those at the Regional Research Centres (RRC). Due to the association of the PGIA in the "split programme training" of Research Officers in the Department of Agriculture for research degrees the experimental station facilities of the RRC 's are also being improved from project grant funds.

Library Resources

The PGIA will continue its efforts to develop the library resources. A comparison of our efforts to improve library holdings between 1976 and 1985 are given in Table 1.

Table 1: Improvement in Library Accessions During the Ten Year, 1976-1985

<u>Accession</u>	<u>1976</u> (Beginning)	<u>1985</u> (End)
Journals	100	165
Books	10,000	25,000
Micro	nil	1,200

We will endeavour to develop the Agriculture library to be the best teaching and research library in agriculture in the country. Future plans include the construction of a new library, computerization and use of new technologies to link our library with others in order to have rapid access to information.

Training

The number of candidates from the different Boards of Study who have completed their postgraduate training during the ten year period 1976 -1986 are given in Table 2. There were 225 graduates distributed among M.Sc (157), M.Phil (55) and Ph.D (13). There has been a greater demand for the M.Sc and M.Phil programmes primarily because of the larger numbers who were eligible for training at this level and secondly because the PGIA was not equipped to handle many Ph.D candidates because of the lack of supervisors during the early years and the policy of many institutions of sending their employees to do the terminal degree (Ph.D) abroad on different aid projects.

Table 2: Postgraduate Degrees Granted from 1976 - 1985

Board of Study	D E G R E E			Total
	M.Sc	M.Phil	Ph.D	
Agric. Biology	28	23	4	55
Agric. Chemistry	18	5	1	24
Agric. Econ. & Ext.	46	2	2	50
Agric. Engineering	15	7	0	22
Animal Science	30	5	0	35
Crop Science	20	13	6	39
	157	55	13	225

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The intake to research degrees is gradually increasing due to the recognition the PGIA has received from local and foreign agencies. The current registrants (Table 3) shows this trend.

Table 3: Current Registrants for Postgraduate Programmes

Board of Study	Diploma	M.Sc	M.Phil	Ph.D	Casual	Provisi- onal	Tot
Agric. Biology	-	3	21	5	2	0	3
Agric. Chemistry	-	11	14	0	0	0	2
Agric. Econ.&Ext.	-	11	31	6	4	2	5
Agric. Engineering	-	13	16	1	1	0	3
Animal Science	-	5	6	1	1	0	1
Crop Science	-	8	22	5	0	0	3
	6	-	-	-	-	-	6
	6	51	110	18	8	2	199

With the implementation of the Diversified Agricultural Research Project (DARP) in 1986, the Agricultural Research Project (ARP) in 1987 and others on the pipeline more M.Phil and Ph.D candidates will enter the PGIA. But we feel the flow of candidates from these projects to the PGIA will largely be from the Department of Agriculture as has been in the past ten years (Table 4).

An examination of the registrants during the last 10 years shows that private students headed the list (Table 4). Of these students about 35 per cent were on scholarships awarded on a competitive basis by different agencies.

IMPROVEMENT OF LINKAGES

Linkages between the PGIA and the Ministries concerned with Agriculture, Livestock, Forestry, Lands, Irrigation etc., could be developed on many fronts. The following are suggested for discussion.

Postgraduate Degree Programmes

We feel that the potential of the PGIA to train post-graduates is not been used to the best possible extent by different institutions. Our records show that the PGIA has developed its capabilities during the last 10 years and the Ministries should therefore use the resources of the PGIA more often to train a larger group of personnel within the country at a low cost to Government. Canvassing foreign aid for such training would be a new approach. It could be developed in two systems of training, namely;

- (a) Full programme training at the PGIA.
- (b) Split programme training at the PGIA and a foreign University.

Postgraduate Diplomas

On the initiative of the Ministry of Plan Implementation a postgraduate Diploma in Food and Nutrition Policy Planning was introduced two years ago to up-grade staff officers of the Ministry who are serving in the districts. Another one on Farming Systems to service five Ministries is now being developed. The FAO has pledged financial support during the initial stages. With the co-operation of the International Irrigation Management Institute short courses on "on farm" irrigation management and soil water conservation will also be developed. There are many more which could be developed with the expertise and resources that are available in Sri Lanka. We need an input from the Ministries to identify their specific requirements and target groups so that the PGIA may respond.

Disparity Between Admissions and Registrants

There is a difference between the number admitted (721) and the number registered (542) during the period under review. The possible reasons and corrective steps that could be taken are listed below.

CAUSES

1. Lack of funds by private students
2. Employer sends employee abroad after admission
3. Employer does not release employee
4. Employees given leave on no pay

POSSIBLE CORRECTIONS

Expand scholarship offers. If identified for foreign scholarship application should not be forwarded. Employer should decide in advance the numbers that could be released. Develop incentive schemes.

Research Funds

From 1976 the Ministries of Agriculture and Plantation Industries have allocated Rs.50,000/= each per year for post-graduate research. Due to increased expenditure these funds are inadequate. We would like these annual allocations to be increased. Since 1978 many departments/institutes that functioned under these two Ministries, were placed under several other new Ministries. Therefore, these Ministries too could help by making an annual allocation which should be incorporated as a separate budget item in their annual estimates. We would recommend them to match the grants contributed by the two older Ministries.

Outreach Programmes

The dissemination of research results and the use of new knowledge and technologies that have been developed from students' research is still weak because the PGIA does not have a mechanism to reach out. The PGIA research students have submitted 64 theses during the last 10 years (Table 5).

Table 5 : Number of theses Submitted Since the Establishment of the PGIA

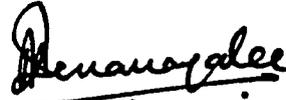
M.Sc (old regulations)	4
M.Phil	47
Ph.D	<u>13</u>
	64
	=====

Besides the publication of papers in recognised journals we have to identify different means of dissemination of research results to reach specific target groups such as researchers, subject matter specialists, extension agents, teachers etc., The Ministries and departments/statutory bodies under them could identify the types of inservice training programmes that they require. The PGIA could then pick the ones which could be done at the Institute using the resources of the PGIA/FA as well as those available outside. Outreach activities in the form of short courses, workshops, conferences, national consultations could be arranged at low cost locally instead of sending participants abroad for the same types and levels of training at high cost. There are different requirements to implement these activities on a continuing basis. Among the most important are ;

- (a) An outreach facility - The Ministry of Higher Education would have to canvass funds to establish one.
- (b) Provision should be made in the PGIA cadre for a Co-ordinator for outreach activities and supporting staff.
- (c) Funds for outreach activities - Could be obtained from different donor agencies under continuing projects or new projects.

- (d) Resource persons - They are available in the different faculties, ministries, departments. If necessary resource people could be brought from outside.

Until a permanent facility is built we could use some of the existing facilities during vacations to make a start. Since we anticipate participants to come from abroad too, a well equipped permanent facility is essential.



Prof. Y.D.A. Senanayake
DIRECTOR/PGIA

YDAS/gfm

ANNEX 6

Faculty of Agriculture 1985 Annual Report

24th September, 1986.

COMPARATIVE ANALYSIS - 1978 and 1986

FROM: Prof. H. P. M. Gunasena
Dean, Faculty of Agriculture

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24/9

AED Project - Final Report

1. <u>Staff</u>	<u>1978</u>	<u>1986</u>
Total staff	56	100
No. of Ph.D's	16	37
Students	110	180
Staff : Student ratio	1:3	1:7

Student admission has been increased to 200, in keeping the AED Project objectives from 1986/87.

2. Courses taught

<u>1978 - 1st year</u>	<u>1986</u>
Crop Production	Crop Production
Animal Husbandry	Animal Science
Agric. Economics	Agric. Biology
Agric. Engineering	Agric. Chemistry
Plantation Evaluation Course	Agric. Economics
	Agric. Engineering
	Plantation Evaluation Course
	Basic Maths
	English Language

2nd year - 1987

Principles of Crop Production
Animal Husbandry
Agric. Botany
Agric. Chemistry
Agric. Economics
Agric. Engineering
Agric. Entomology

2nd year - 1986

Crop Production & Biomet
Animal Science
Agric. Botany
Agric. Chemistry
Agric. Econ. & Extension
Agric. Engineering
Agric. Entomology

3rd year

Crop Production
Animal Husbandry
Agric. Botany
Agric. Chemistry
Agric. Economics
Agric. Engineering
Plant Protection

3rd year

Crop Production & Biometry
Animal Science
Agric. Botany
Agric. Chemistry
Agric. Econ. & Extension
Agric. Engineering
Plant Protection

4th year

400 series (1st Term)

Crop Production
Animal Husbandry
Agric. Economics
Agric. Extension
Agric. Engineering
Biometry

4th year

Crop Production & Biometry
Animal Science & Food Sc.
Agric. Econ. & Extension
Soil-Plant-Water relations

500 series

Field Crop Production
Horticulture Crop Production
Plantation " "
Animal Husbandry

500 series

501 - Crop Sc. Research Project on
Crop Production
Field Crop Production
Horticultural Crop
Production
Plantation Crop
Production

Best Available Document

1973

Genetics, Plant Breeding
Plant Pathology
Soil Science
Food Science & Technology
Agric. Econ. & Farm Management
Agric. Education & Extension
Agric. Entomology

1976

Agricultural Silviculture
Minor Export Crop Production
Integrated Agriculture
Crop Experimentation

502 - Animal Science

Research Project on Animal
Animal Genetics & Breeding
Reproductive Physiology &
Artificial Insemination
Lactation Physiology &
Digestion in Pre-ruminants
Monogastric Nutrition
Ruminant Nutrition

503 - Agric. Biology

Research Project on Agric.
Biology
Agricultural Micro-biology
Plant Pathological Techniques
Applied Entomology
Apiculture
Genetics & Plant breeding

504 - Agric. Chemistry

Research project on Agric.
Chemistry
Food Chemistry
Food preservation & process
Food Microbiology
Soil Fertility
Soil Chemistry
Soil Physics

Best Available Document

505 - Agric. Economics & Extension

Research project on Economic
& Extension

Rural Development

Farm Management and Producti.
Economics

Social Survey Methodology &
Quantitative Methods

Agric. Extension

Agric. Extension Methodology
Evaluation

Agric. Projects & project
analysis

506 - Agric. Engineering

Research project on Agricultural
Engineering

Farm power & Machinery
Management

Agric. Processing & Storage

Soil Water Engineering

Energy & Waste Management

Structural mechanics & Farm
structures

Soil conservation Engineering

Please note that the syllabus was revised in 1981.

Creation of New Departments: Soil Science
Food Science & Technology
(created by splitting the former
Dept. of Agric. Chemistry).
Request for a new Dept. of
Plant Protection has been approved
by Faculty.

Seminars :

Many seminars were presented. They are too numerous to present here. The most important was the seminar held in August 85, in collaboration with Commonwealth Scientific Societies.

Research :

1978

1986

Funds :

Rs. 185,000

about 20,000,000 million

Link Programmes :

Belgian N-fixation project

Straw utilization project

Research Areas :

Research areas and their depth has increased. The research topics could be obtained from the latest newsletters. Research publication per year is over 80, compared with less than 20 in 1970's.

Facilities :

Class Rooms:

Has not expanded up to now. When the Agric. Biology-Chemistry complex is completed 55,000 sq. ft. area will be added. The cost of this building is Rs. 37 million, and approved by UGC. It is intended to increase the administrative space, and land has been secured in 1986. The anticipated cost is Rs. 12 million.

Experimental Farms : All have expanded in some manner.

Dodangolla : Student hostel - Rs. 650,000

New Buildings : Plant House - Rs. 1.0 million
Administrative Block - 1.2 million
2 staff house - Rs. 400,000

Maha-Illuppallama new buildings : 3 staff houses - Rs. 1.3
Toilets
Girls Hostel - Rs. 4 mill
Construction will in 1986

New Animal Husbandry Building :

New building costing Rs. 12 million has been approved by the Government in 1986.

Equipment

Value of Equipment is not assessed, but should be in the region of Rs. 100 m. All the Departments are fairly well equipped new.

International :

Faculty/PGIA has been identified as a "Center of Excellence" in S&SE Asia by IDRC. The plan is to develop facilities for short term training at all levels.

Co-operative Relationships

In 1978 - Only a very few, eg. the only one I am aware of is the SEARCA, Philippines joint programme on Agricultural Research Management.

In 1980, there are many :

1. With University of Maryland.
2. With University of Belgian, Leuvan.
3. With IDRC who is sponsoring undergraduate students from Bhutan.
4. With German Technical Corporation who is sponsoring Nepalese student.
5. FAO/UNDP sponsoring students from Maldives.
6. ODA is sending a "fact finding mission" to provide links with British Universities in November.

7. There are co-operative agreements, with local institutions such as the Department of Agriculture, Plantation Industries, Minor Export Crops, Agrarian Research & Training Institute etc.,

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Prof. H.P.M. Junasena
Dean/Agriculture.

24/12

Best Available Document

My Ref : Ag/D/3/AR

2. Faculty of Reports
1. Faculty of Agriculture

ly →
Dean / Ag. rec
23/5

(As reported by the Dean, Professor. H.P.M. Gunasena)

Academic

The senior staff of the Faculty had to undertake a heavy teaching load as several junior staff members were on probationary study leave. Although the numbers on study had decreased compared to the previous year, the resignation of some members of the senior staff created problems. In spite of various constraints the academic program was smoothly continued and all the examinations were held at the scheduled times. The first year courses commenced in October 84/85 as scheduled, although the other Faculties in the University commenced their new academic year only in January 1986. The 1st year Plantation Evaluation Course was funded by the Ministry of Plantation Industries and the creeper level training for a few selected of students was provided by the Janata Estate Development Board and the State Plantations Corporation. Both these courses were satisfactorily completed.

The Faculty has been well recognized by the Universities all over the world. This has been amply demonstrated by the scientists who visited the Faculty for teaching, collaborative

research or consultative assignments. Drs. David Bessler, Randall Kramer, James B Mayfield, Chiko Haramke, and D.P. Knieval, visited the Faculty in connection with the USAED/PGIA/Faculty Project. A team from the Netherlands consisting of Drs. D. Temmelink, Rudoy A Prins and Geerp Taminga visited the Faculty to evaluate the straw utilization project, a collaborative program between the Faculty, National Livestock Development Board and the Government of Netherlands. Drs. Pedro Flores and Vijay Pande from the International Development Research Center (IDRC), Canada visited the Faculty in connection with the admission of Bhutanese students.

The Faculty admitted 10 Nepalese students making the total foreign students so far admitted to 20. Their study courses were funded by the West German International Co-operation whose Head is Mr. F.G. Heim. Mr. Heim has requested an increase in the admission of Nepalese students to 15 per year for which UGC approval has been obtained. In addition to the Nepalese, 6 Bhutanese students were also admitted to follow the B.Sc (Agric.) Degree program. These students were admitted as a result of the International Development Research Center (Canada) (IDRC) recognizing the Faculty as a "Center of Excellence" for agriculture education in S & S.E. Asia. The Bhutanese were funded by the IDRC.

The UGC approved four new courses which were

implemented in the year under review. They were Floriculture, Inland Fisheries, Post harvest Technology and Irrigation Water Management. These courses although, implemented with insufficient facilities, will require specific equipment for their proper implementation. A request to this effect has been made to the UGC. The most significant achievement in the academic sphere has been the admission of 177 students to the 1st year courses at Maha-Illuppallama. This is nearly a 40% increase compared to admissions made in previous years. Several problems arose due to extra intake, primarily due to inadequate class rooms, laboratories, and even accommodation in hostels. These problems, however were over come by adanting adhoc measures but certainly financial provision for all the above mentioned capital works should be provided if admission is to be maintained at the present levels.

Staff Training and Development

The staff training program under the USAED/Faculty PGIA project which commenced 7 years ago continued. Nine (9) staff members returned after obtaining their Ph.D Degrees, while 22 others have completed the in-country thesis research and are due to return in October 1987. A problem that has arisen in this program is the attrition, specially with the Tamil members of staff. Up to the present 6 of them have failed to return and has caused serious problems both to the Faculty and the AED Project. The cost of their training is around \$ 60,000 - 70,000 and recovery

of these also appears to be difficult. All possible actions have been taken by the University with the help of the USAID, Colombo to recover the cost of training and also to arrest further attrition. Some other staff members were also trained at the Obihiro Chikusan University of Japan. Katholieke University of Leuvan, Belgium and some British and New Zealand Universities. At present the Faculty staff consists of 35 Ph.D's, 45 MS/M.Phils and 20 B.Sc. Agric. (Hons) Degree holders. Several posts also remained unfilled due to the lack of suitability qualified applicants.

Dr. (Mrs) J. Galappatti (Plant Pathologist) joined the Faculty as a Lecturer in Agricultural Biology.

Participation in National Development Programs and Other Activities

The fifth consortium Council meeting of the USAED/Faculty/PGIA Project was held at the Virginia Polytechnic and State University, USA. All Deans and Campus Co-ordinators attended this meeting, while Professors H.P.M. Gunasena and T. Jogaratnam participated from the Faculty and PGIA respectively.

Six Senior Staff of the Faculty namely, Professors H.P.M. Gunasena, Y.D.A. Senanayake, A.S.B. Rajaguru, Drs. J.M.R.S. Bandara, K. Kailasapathy and S. Ranasinghe served as consultants to the International Winged Bean Institute.

Drs. H.M.G. Herath, C. Sivayoganathan, C. Bogahawatte and S. Pinnaduwege continued the Socio-Economic studies on the Village Irrigation Rehabilitation Project (VIRP) which was funded by the World Bank. Prof. H.P.M. Gunasena Co-ordinated this study. Prof. H.P.M. Gunasena continued to serve as a member of the Board of Governors of the Agrarian Research and Training Institute and the Coconut Development Training Center of the Ministry of Coconut Industries. Prof. Gunasena was awarded Senior Travelling Fellowships by the Association of Commonwealth Universities (London) which enabled him to visit several Universities in UK, India, Malaysia, Singapore and Bangladesh.

The opportunities for working in close collaboration with line Ministries has been serious constraint to the further development of the Faculty. There should be functional linkages, if the qualified staff is to fully utilized in national development efforts..

Facilities Development

The construction of the Agricultural Biology Chemistry building complex was not completed at the end of the year as previously scheduled. The beams on the 3rd floor of this building showed signs of weakness due to architectural deficiencies and they had to be corrected. The extra cost for the strengthening of the beams have been estimated at Rs. 3 m, and due to these corrections the building completion may take another 6-9 months. The construction of an Administrative Block at the Dodangolla

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Experimental Station was completed, but the wiring of the three staff houses is yet to be done. Because of this delay those houses have remained unoccupied at least for the last 6 months. Three staff houses have been constructed at Maha-Illuppallama using the funds made available by the UGC for Experimental Station Development under the USAED/PGIA/Faculty project. This brings the total number of houses up to 6, and three more houses have to be completed to provide accommodation for all staff members. The construction of the silos at the Mawela Livestock Station were also completed, but the general maintenance of the buildings were in a chaotic state due to poor facilities provided by the Maintenance Division. At the Faculty, the Crop Science Department was able to construct an Oven House and a Plant House. Both these buildings and a retaining wall were constructed by using direct labour and by this procedure the cost was minimised.

The "Faculty News Letter" has become an organ of communication for all Faculty news and it has established itself well. The Vol. 4 (1) and (2) were published and distributed to local as well as foreign educational and research agencies free of charge. The Journal of the National Agricultural Society was also published, which is one of the premier agricultural Journals of this country. A special issue of the Journal devoted to the research on Minor Export Crops was also published which was funded by the United Nations Development Program.

The Faculty/PGIA library made tremendous progress in the year under review. The allocation for the library from the University was Rs. 0.589 m and the donations from the ODA, ISNAR and Netherlands Book Program Project amounted to Rs. 3.35 m.

The USAED/PGIA/Faculty project provided 3540 books at a cost of US \$ 129456. It has also subscribed to 63 journals in 1985 and 11 periodicals. Several literature searches were made through AGRIS based in Vienna.

Research

The staff of the Faculty published many research papers and scientific communications exceeding the numbers that were published in the previous year. The funds for their research has been received from various sources including the US Agency for Technical Co-Operation, International Atomic Energy Authority, International Development Research Center (IDRC), Canadian International Development Agency (CIDA), Department of Agriculture and the University of Peradeniya. The total research fund received was about Rs. 10 m. Besides these, several research linkages were in progress namely, the Legume Nitrogen Fixation Project in collaboration with the Katholike University (Leuvan) Belgium, Legume Cereal Intercropping in collaboration with the University of Maryland, USA, Straw Utilization Project in collaboration with the Government of Netherlands. The

postgraduate student research was also another aspect that influenced the staff research and the Postgraduate Institute of Agriculture will be an important source research funding for the Faculty.

Constraints

Several problems arose in providing assistance to the University College at Batticaloa, as in the previous year. The senior staff of the Faculty were reluctant to visit the Batticaloa Faculty due to the prevailing ethnic disturbances and monitoring of the student teaching and the other academic programs came to a virtual halt. As identified in the earlier reports, they lacked basic teaching equipment and other field facilities to provide a quality degree in Agriculture. The situation became even worse when the Karadian Aru Farm where the students planned to have their field oriented training was blasted by the terrorists. The Peradeniya Faculty of Agriculture has repeatedly requested the authorities to rectify the above situation, but due to various reasons not much constructive progress has been made. Then the Faculty requested for deaffiliation as it was not prepared to sacrifice the quality degree offered at Peradeniya to those students receiving substandard training at Batticaloa. After serious dialogue the HE President and Minister in charge of Higher Education agreed to deaffiliate Batticaloa University College from Peradeniya University, effective from October 1986.

A serious constraint at Maha-Illuppallama has been the lack of hostel and lecture room space for additional intake of students in the 1985/86 academic year. The admissions increased to 177 from the usual 120, inclusive of 12 Sinhala Students transferred from Batticoloa University College. The University Grants Commission provided additional funds for the purchase of furniture, but building space was highly inadequate in the hostels as well as in class rooms. At the Faculty, the completion of the Agricultural Biology-Chemistry building complex was unduly delayed due to defective beams which had to be corrected. The cost of this building, has been now estimated at Rs. 33 million, which is over 50% of the original estimated cost. The general repair and maintenance of Faculty and Maha-Illuppallama buildings as well as the animal units progressed very slowly due to poor organization on the part of the Maintenance Department.

The staff turn over was a serious problem in the year under review. Several senior members resigned, partly in view of the ethnic problem, and partly due to poor remuneration, lack of housing and other fringe benefits enjoyed by the paralled services. Therefore, adequate remuneration, and provision of housing and other facilities will be very essential to retain the staff.

In regard to staffing, Assistant Registrar's position was disallowed and administration suffered to a great extent.

The vacancies in the staff cadre couldn't be filled as poor salaries discouraged the prospective applicants. Therefore, Temporary Staff had to be utilized for teaching, although this procedure was not too satisfactory. The staff of the ancillary facilities were highly inadequate, resulting Heads of Departments devoting time for their day to day activities rather than for academic activities.

The potential for the development of the Faculty is very high, but further development and expansion within the frame work of a traditional university appears very difficult. Further more, there hardly any land for expansion, and requests for land from the other Departments located closely have to be made if further expansion is anticipated.

Department of Agricultural Economics & Extension

Dr. H.M.G. Herath functioned as the Head of the Department in 1985. Mr. H. Talgaswatta, Miss. B.M. Leelawathie, Mr. M.I.M. Rafeek, Miss. U. Rajaratnam and Miss. M.C.K. Mohottala assisted the Department in its teaching and research on a temporary capacity.

Staff development through AED continued. Mr. H. Wickramasuriya returned from Pennsylvania State University after completing his Ph.D. Mr. A.V.G. Piyasena and Mr. S.M.M. Zuhair returned to Sri Lanka for in country research from

Texas A&M University and Virginia Polytechnic Institute and State University respectively. Mr. Piyasena completed his Ph.D. in country research and returned to Texas A&M University. Dr. H.M.G. Herath visited the Philippines and India in July and October respectively. Dr. S. Pinnaduwege spent the long vacation in the Technical University of Berlin, Germany. Dr. C. Bogahawatte attended the FAO marketing seminar in Bangkok and the International buffalo Congress in Cairo while Dr. C. Sivayoganathan attended an Extension Training Programme in Korea.

Technical Assistance continued under the AED Project. Dr. David Bessler and Dr. R. Kramer visited the department to supervise Mr. A.V.G. Piyasena & Mr. A.M.M. Zuhair's field work respectively. They presented two seminars each at the Faculty and the Postgraduate Institute of Agriculture.

An appreciable amount of equipment aid was received during the year from the AED Project. Spare parts to the off-set printer in the Media Unit and audio-visual equipment for the proposed Audio-Visual Unit were also received. The off-set printing facility was used to complete several jobs for the University. Agriculture Faculty News Letter, Vol. 4 No. 1 & 2 of 1985, one working paper on VIRP, and the Sri Lanka Journal of Agricultural Sciences, 1985 were printed in the unit.

The Agricultural Economics Research Unit continued research on two projects, one on marketing and the other on

extension. Substantial development in research of applied nature was still a major feature in 1985. Participation in national development activities were further increased with departmental members working on small holder Rubber Rehabilitation Project, Village Irrigation Rehabilitation Project, Major Irrigation Rehabilitation Project, Integrated Rural Development Programmes in Badulla District, Small Holder Productivity, Rice Drying and rice processing. These helped to create employment of temporary nature for several Agricultural and other graduates, and provided more opportunities for them to gain valuable field experience.

Two documentaries on straw treatment were prepared by the audio-visual unit.

Department of Agricultural Engineering

Dr. S.G. Ilangantileke served as the Head of the Department until the end of April. He left for Asian Institute of Technology in Bangkok, Thailand as an Associate Professor on his sabbatical leave. Mr. Goonasekera completed his data collection for Ph.D. research and left for Virginia Tech. in February. Mr. E.R.M. Gunawardene who returned to island for his Ph.D dissertation research functioned as the Acting Head of the Department till the end of November. Dr. K.G.A. Goonasekera who returned to the island after successfully completing his Ph.D. degree in October was

appointed as the Head of the Department from December.

Mr. W.V. Jayasena continued to serve as a probationary Assistant Lecturer and expected to leave for Bangkok, Thailand to continue graduate studies at the Asian Institute of Technology at the end of the year. Mr. A.R. Ariyaratne and Mrs. Amala Jayasekera returned to the island to collect data for their Ph.D. dissertation research and left again after completing their researches to Texas A&M and Utah State Universities respectively to complete their studies.

Mr. Harendra D. Fernando joined as a research assistant to the USAID sponsored research project on Jatropha as a diesel substitute. Mr. I.D.S. Dharmasiri and Mr. Dias Gunasinghe continued to serve as research assistants to the FAO sponsored research project on design of a paddy drier. Since Dr. Ilangantileke had to leave, Professor H.P.M. Gunasena was appointed as the National Co-ordinator of the Paddy drier design project while Mr. Sarath Seneviratne of the Department of Mechanical Engineering was appointed as the co-ordinator of Jatropha project. Dr. Ibrahim was appointed as the co-ordinator of the Buffalo drawn implements design project sponsored by NRESA. Mr. E. Rechart who was an Associate Expert from FAO to assist the Paddy drier design left the island in July after completing his assignment. Dr. Goonasekera was appointed as a member of the NFMC in the place of Dr. Ilangantileke. He also became a consultant to the Sugar-cane Research Institute.

Mr. D.K.W. Dias, Mr. H.M. Hemakumara, Mr. D.I. Kommala, Mr. D.M.A.P. Dissanayake, Miss. S. Athpittanath and Mr. K. Manokararajah served as temporary teachers and assisted the Department teaching program.

Mr. E.R.N. Gunawardene participated in an International Workshop on Operational Applications of Mathematical Modelling in Developing Countries and visited New Delhi, India for the same. Dr. Ilangantileke returned to island in December on an assignment as a consultant to the Paddy Marketing Board.

Technical assistance continued under the AED project and last consignment of equipment under the USAID project was received during this year.

Department of Animal Science

Prof. A.S.B. Rajaguru continued as Head of the Department. Under the Corporate Plan of the U.G.C. the department was permitted to initiate a new courses in Inland Fisheries from 1986 and was requested to plan the requirements to establish a division of Inland Fisheries and Aquaculture in the Department.

Dr. (Miss) S. Panditharatne returned after completing M.Sc and Ph.D in Ruminant Nutrition from Virginia Polytechnic Institute and State University (V.P.I.) in January 1985. Dr. V. Ravindran returned from the same

University after completing M.Sc and Ph.D in Monogastric Animal Nutrition in August 1985. Mrs. R. Santha returned from the Asian Institute of Technology after completing M.Sc in Aquaculture in November 1985.

Prof. R. Rajamahendran resigned from the department in December 1985. Dr. K. Nadarajah failed return to the Department after completing a Ph.D in Animal Genetics at the ~~U~~.P.I.

Mrs. K. Perera returned to Virginia Polytechnic & State University in U.S.A. in October, after completing the incountry' research for a Ph.D in Reproductive Physiology and Mr. H.W. Cyril returned to the University of Nottingham to pursue a Ph.D programme in Meat Science after completing the requirements for a M.Phil degree.

A two day seminar on the potential of rice straw as a ruminant feed in Sri Lanka was organized collaboratively by the Department of Animal Science and Straw Utilization Project of Sri Lanka was held on 7th and 8th of February, at the Postgraduate Institute of Agriculture.

Plans were finalized and funds were allocated for the New Animal Science building to commence in early 1986. The evaluation team of the Straw Utilization Project that visited Sri Lanka in 1985 has recommended to donate a sheep metabolism unit to the department to be established in 1986.

Department of Crop Science

Dr. R.H.G. Clements continued as Head of the Department. Besides the Academic matters in the Department, the administration of the Experimental Station at Dodangolla continued to be the responsibilities of the Department of Crop Science.

The Department conducted the Plantation Evaluation Course for the 1st year students at Oduwela Estate with funds received from the Ministry of Plantation Industries.

This year also 35 students of the Final Year batch followed advanced courses offered by the Crop Science Department.

Dr. R.H.G. Clements and Dr. U.R. Sangakkara were involved in research activities of the collaborative research projects with the Katholieke University of Leuven, Belgium on Biological Nitrogen Fixation. In this connection Dr. Clements proceeded to Belgium on a Senior Fellowship. Dr. K.P. Premaratne attended the seminar on marketing and quality control of agricultural products held at Technical University of West Berlin.

Dr. R.O. Thattil returned to the Department after completing the Ph.D degree at Virginia Polytechnic and State University, USA. His field of study was Biometry.

Dr. S.L. Ranamukhaarachchi assumed duties after completing the Ph.D degree at Penn. State University, U.S.A.

He also visited IRRI, Los Banos, Philippines to study the on going cropping systems programme.

Professor Y.D.A. Senanayake, Professor of Crop Science, attended a seminar on National Agricultural Research Systems in Netherlands and he is serving as a consultant to the International Winged Bean Institute.

Dr. U.R. Sangakkara left for Canada on Vacation leave under IAEA Fellowship.

Mr. Bararajasingham, Mr. Ajith Perera and Mr. B.C.N. Peiris returned to the Department for in-country research having completed M.S. degree's and returned to Penn. State University, U.S.A.

Mr. A. Thiruketheeswaran, a Assistant Lecturer resigned from the Department of Crop Science.

Mr. J.P. Theerthisinghe, a Teaching Assistant left for New Zealand on probationary Study leave.

The Department has completed the construction of a Oven House and a Plant House.

Agriculture Experimental Station, Dodangolla

Dr. S.L. Ranamukhaarachchi was appointed as Lecturer In-Charge of the Dodangolla Experimental Station on September. Mr. A.M.K.B. Attanayake acting Farm Manager

returned to the Department of Crop Science and Mr. A.A. Atapattu, an Agricultural graduate, was appointed in his place until Mr. G.S. Premachandra, returns after completing his M.Sc. degree.

The total annual rainfall was 87 inches in 1985, and both Maha and Yala seasons received sufficient rains. Therefore, Pumpkins, Manioc, Brinjal, Carrot, Okra, Pole beans, and Mung beans were successfully cultivated. Due to the multitude of improvements in the plant house Pepper, Coffee, Mango, Citrus, Avocado, Kak and Floricultural crops were raised successfully and marketed.

" The new administrative building and three houses for staff was completed and all officers were shifted to the new buildings.

The farm continued to provide facilities for research for undergraduate as well as graduate students. Mr. N.C. Rajapakse and Mrs. S. Rajapakse conducted in-country field research for their doctoral programs in the farm.

Sub Campus at Maha-Illuppallama

The early part of 1985 saw the completion of the practical course of the 1984/85 batch of first year students. Exams were held on schedule in April, and the students commenced the Plantation Course at Oduwela Estate Kandy in May.

The farm practice course for the first year students of the 1985/86 academic year commenced on schedule with the on set of the Maha season in October at Maha Illuppallama. The intake was increased to 161 students from Sri Lanka. Due to the success of the German-Nepal-Sri Lanka training programme the intake of Nepalese students was increased to 10. In addition six Bhutanese students were also admitted to the first year on a IDRC programme. This indicates the international recognitions of degree programme of this faculty.

The major constraint faced due to the increased intake was the inadequate facilities. The students and staff worked under trying and difficult conditions to make the programme a successful venture.

As in the past year, Dr. U.R. Sangakkara Co-ordinated the MI programme, with the assistance of members of staff and Dean of the Faculty. Dr. H.V.A. Wickramasuriya assumed duties as lecturers in charge of the unit, in October 1985, on his return from Postgraduate training. During the course of the year Mrs. Chitra de Silva returned after obtaining her M.Sc degree from Japan, while Mr. S.C. Thrimavitane left for Belgium to follow a programme of work for his postgraduate degree.

Work continued on the improvement to hostel and the teaching units of the Subcampus. Renovations were done to the hostels and a new toilet facility constructed to accommodate the increased intake. In addition, work was begun on three staff quarters during the latter part of the year. The work on these units are on schedule and they will be ready in 1986.

A planting programme was initiated by the staff at MI to develop the unit. Many valuable perennial tree species were established by the students during a 'Shramadana' programme, which will be an asset for the practical lessons.

The students took the initiation of organizing social activities, which were carried out successfully.

DEPARTMENT OF AGRIC. BIOLOGY

Dr. J.M.R.S. Bandara was re-appointed as Head of the Department in February.

Dr. Tissa Senaratne, (Plant Physiologist) resigned from the University service.

Dr. (Mrs.) Manakie Gallappatti, joined the Department as a lecturer in Plant Pathology.

Dr. A.L.T. Perera, returned to Faculty in October with a Ph.D in Quantitative Genetics from University of Birmingham, U.K. He was selected as a member of the New Rice Genetic Corporative, centred in the Philippines, IRRI.

Mrs. I.P. Wickramasinghe, (lecturer in Genetics) attended a training programme in Crop diversity and Germplasm conservation in University of Birmingham.

Mr. Wijegunasekera, lecturer in Entomology spend three months working on his Ph.D programme in Katholieke University of Belgium.

The Department staff was engaged in teaching research, and out reserach activities in the field of Plant Protection and Plant Breeding. Dr. Bandara served as a member of the research advisory committee of the Paddy Marketing Board of Sri Lanka and Dr. Ranasinghe as a research advisor to the Sugarcane Research Institute and Ministry of Plantation Industry.

Department received video equipment as the final consignment of the equipment under USAID programme.

The long awaited Rs. 33 million Agricultural Biology building complex showed some progress, and is expected to be completed soon. The present agricultural biology building was completely rehabilitated. The Department wishes to appreciate the corporation and untiring efforts by the Vice Chancellor, Dean, Agriculture and the members of the Bureau's department in expediting the building programme in the midst of many constraints.

B. Research

Crop Science

- Study on the rate of application and uptake of nutrients in winged bean - H.P.M. Gunasena & S. Parthipan
- Effect of different storage conditions and time on viability of winged bean seeds. - H.P.M. Gunasena & S. Parthipan
- Optimum N, P and K rates for winged bean. - H.P.M. Gunasena & S. Parthipan
- Optimum spacing for winged bean. - H.P.M. Gunasena & S. Parthipan
- Internation NFT adaptability trials. - H.P.M. Gunasena & P.M.S. Bandara
- Local winged bean germplasm evaluation. - H.P.M. Gunasena & I.P. Wickramasinghe
- Fertilizer interactions in winged bean. - H.P.M. Gunasena
- Cereal-legume-vegetable intercrop systems. - H.P.M. Gunasena & A. Samaranayake
- Collection, taxonomical and biochemical classification of aroids, dioscoreas and plectranthns Spp. - H.P.M. Gunasena S. Balasubramanium & S. Harischandra
- Agro-economic and sociological studies on the chena cultivation systems in the Hambantota and Moneragala districts. - H.P.M. Gunasena & F. Abeyaratne
- Weed control in rice with machete - H.P.M. Gunasena & Mrs. C.S. Jayaweera
- Status of the cereal seed industry in Sri Lanka. - H.P.M. Gunasena

- Seed size and spacing on yield of aroids.
- Fertilizer potassium effect on yield and quality of pineapple
- Cropping systems for "a" systems of mahaweli.
- Adaptability studies in winged bean.
- Nursery management of minor export crops.
- Agronomy of grain legume crops.
- Intensive cropping to maximise light utilization in annual crops.
- Role of legume crops in rice based cropping system.
- The use of systematic designs in plant density and spatial arrangement studies in winged bean, green gram & cowpea.
- Influence of light intensities on rooting and growth of pepper.
- Testing intraspecific incompatibility in winged bean.
- Studies on seed germination in winged bean.
- H.P.M. Gunasena & U.R. Sangakkara
- K.P. Premaratne, H.P.M. Gunasena & U.R. Sangakkara
- K.P. Premaratne, U.R. Sangakkara & P.A. Tennakoon
- U.R. Sangakkara, R.H.G. Clements & P.A. Marasinghe
- U.R. Sangakkara
- R.H.G. Clements
- R.H.G. Clements
- R.H.G. Clements & U.R. Sangakkara
- R.O. Thattil & R.H.G. Clements
- Y.D.A. Senanayake
- Y.D.A. Senanayake
- Y.D.A. Senanayake

Animal Science

- Management practices to improve the nutritive value of panicum : maximum (guinea A).
- Nutritive value of winged bean residues for animal feeding.
- Factors affecting quality of rice bran.
- Collection and nutritional evaluation of non traditional feed stuffs.
- Evaluation of in vitro techniques used in digestibility determination.
- Colacasia esculenta (taro) corm meal as an energy supplement for poultry.
- Biogas and fish integration.
- Utilization of winged bean as a livestock feed.
- Utilization of velvet bean as a livestock feed.
- Ensiling characteristic, digestibility and palatability of guinea "A" grass in the mid country wet zone of Sri Lanka.
- I. Yamane & M.N.M. Ibrahim
- G.D. Warusawitane & M.N.M. Ibrahim
- H.D. Leelawardena, M.N.M. Ibrahim & J.B. Schcire
- V. Ravindran
- H.T. Navaratne, M.N.M. Ibrahim & J.B. Schcire
- K. Samarasinghe
- A.S.B. Rajaguru
- A.S.E. Rajaguru
- S. Panditharatne & M.N.M. Ibrahim

protein and fodder legumes on intake, digestibility, growth response and rumen parameters of buffalo fed urea treated rice straw. - J. Ranjitharatne & M.H.M. Ibrahim

Effect of light on puberty of buffalo - E.R.K. Perera

Agricultural Biology

Role of natural enemies in a soybean ecosystem. - D. Ahangama

Use of botanicals in insect pest control. - S. Ranasinghe

Effect of paraquat on nitrogen fixing bacteria. Biological N Fixation - J.M.R.S. Bandara

Human exposure to pesticides during agricultural practices.

Effects of soil factors on interaction of carbofuran with soil micro organisms. - H.N.P. Wijayagunasekera

Pesticide residues in the environment and human exposure. - J.M.R.S. Bandara
H.N.P. Wijayagunasekera

Estimation of cross pollination % in Winged bean. Evaluation of genetic diversity of local winged bean germplasm. - I.P. Wickramasinghe

Genetical Architecture of yield components in rice. - A.L.T. Perera

Soci-economic evaluation studies in village irrigation rehabilitation projects. - H.M.G. Herath
S. Pinnaduwege
C. Bogahawatte & C. Sivayoganathan

Coconut small holder development - H.M.G. Herath

Productivity and employment in small scale farming. - H.M.G. Herath

Department of Agricultural Economics & Extension

- Rehabilitation of coconut small holder sector in Sri Lanka. - H.M.G. Herath
- Socio-economic evaluation studies in village irrigation rehabilitation projects. - H.M.G. Herath
- C. Bogahawatte
C. Sivayoganathan
S. Pinnaduwege
- Economics of rice drier development in Sri Lanka. - H.M.G. Herath &
S.G. Ilangantileke
- Vegetable marketing in Nuwara-Eliya District. - C. Bogahawatte
- Manpower requirements in Agriculture. - T. Jogaratnam
Effectiveness of regional Agricultural research centers. Irrigated agriculture and resource conservation.
- A study of farmers perceptions of the usefulness of publications and broadcast programs of the Department of Agriculture. - C. Sivayoganathan
- Household utilization of vegetables: A study of knowledge, attitude and nutrient losses. - C. Sivayoganathan
K. Kailasapathy

- Environmental effects of agriculture particularly with reference to soil erosion economics. - H.M.G. Herath
- A study of farmer's perceptions of the usefulness of publications and farm broadcast programs of the Department of Agriculture. - C. Sivayoganathan
- Study on the tea small holding in Badulla district. - T. Jogaratnam & C. Bogahawatta
- Whole sale and retail price analysis of tree crops. - C. Bogahawatta
- International trade of minor export crops. - C. Bogahawatta
- Vegetable marketing in Nuwara-Eliya District. - C. Bogahawatta
- Study of irrigation schemes in Badulla. - H.M.G. Herath & C. Sivayoganathan

Agricultural Chemistry

- Nutritional evaluation of home garden. - K. Kailaspathy & H.E.M. Gunasena
- Use of solar dehydration as a method of preservation to minimize the loss of home garden crops. - C.R. Liyanage & K. Kailaspathy
- Puffed rice production studies on feasibility and acceptability as breakfast snacks in Sri Lanka. - K. Kailaspathy & S.F. Hussain

- Studies on lipoxxygenase activity in winged bean seeds. - K. Kailasapathy
- Development of a solar dryer for peanuts. - U. Samarajeewa
- Physico-chemical properties of rice growing soils in Kandy district. - M.W. Thenabadu
- Effect of potassium buffer capacity and mobility of non-exchangeable potassium on the availability of potassium in some of the important rice soils of Sri Lanka. - G. Keerthisinghe, M.W. Thenabadu & P. Weerasinghe
- Studies on the availability of phosphorus in some of the important soils in Sri Lanka. - G. Keerthisinghe & D. Kumaragama
- Effect of potassium on nitrogen use efficiency of winged bean. - G. Keerthisinghe & A. Senaviratne
- Effect of incorporation of organic matter on nitrogen dynamics of paddy soils. - G. Keerthisinghe, R.H.G. Clements, Upasena Herath & A.K.N. Soya
- Characterization of soil hydraulic properties in two Sri Lankan soils. - R.B. Mapa
- Kinetics of K in andosal of Tokachi plain, Hokkaido. - L.G.G. Yapa &
- Potassium availability in some commonly occurring rocks of Sri Lanka. - J.E. Niwas, C.B. Dissanayake & G. Keerthisinghe

- Effect of soil moisture on the availability of potassium in soils. - G. Keerthisinghe &
- Studies on the effect of rice husks and coir dust on N-mineralization in different textured soils. - A.N. Jayakody
- Effect of Machete and Gall on N-mineralization. - A.N. Jayakody
- Evaluation of nutrient leaching in non^{calcic} calcic brown soils of Mahaweli system B under irrigated rice. - A.N. Jayakody,
L.G.G. Yapa,
H. Upasena &
K.H.A. Kendaragama
- Nutritional home gardening. - K. Kailasapathy &
H.P.M. Gunasena
- Preliminary studies on processing of winged bean seeds onto milk and its utilization. - K. Kailasapathy
- Preliminary studies on single cell oil production by filamentous fungi. - K. Kailasapathy
- Macro and micro nutrient status and clay mineralogy in some soils of Sri Lanka. - L.G.G. Yapa &
T. Yangihara
- Investigation of plant opal phytoliths in some soils of Sri Lanka. - R. Kondo &
L.G.G. Yapa

Agricultural Engineering

- Development of a solar drier for the Department of Minor Export Crops. - S.G. Ilangantileke &
W.V. Jayamena

- Evaluation of the gas production of various farm waste and economics of bio-gas usage. - S.G. Ilangantileke, G. Upasena &
- Assessment of draught power in buffaloes. - S.G. Ilangantileke &
- A case study of farm level water management and application of system analysis to develop feasible water management strategies for the dry zone of Sri Lanka. - K.G.A. Goonasekara
- Development of a sediment transport computer model for application in Sri Lanka. - E.R.M. Gunawardena
- Feasibility implementation of soil conservation practice in the Walagampaya village of Kandy District. - S.G. Ilangantileke & E.R.M. Gunawardena
- Qualitative and quantitative losses during milling in three different commercial rice mills of Sri Lanka. - W.V. Jayasena & S.G. Ilangantileke
- Feasibility of promoting jatropha curcas oil as fuel substitute. - S.G. Ilangantileke, S. Seneviratne & H.D. Fernando
- Design, development and dissemination of a suitable small scale paddy drier. - S.G. Ilangantileke, H.P.M. Gunasena, I.D.R. Dharmasiri & H.D.D. Gunasinghe
- Survey of rice drying techniques and the design of a dryer. - S.G. Ilangantileke
- Hydrology and climate of Mahaweli "H" area (Man & Biosphere project) - S.G. Ilangantileke & S. Pathmarajah

SEMINARS AND CONFERENCES ATTENDED BY THE STAFF

1. Ariyaratne, A.R. - International food and water conference. Texas A & M University, May 26 - 28.
2. Bandara, J.M.R.S. - Regional seminar on biotechnology as a tool in environment management. Peradeniya, Oct. 16.
3. Bogahawatte, C. - Regional seminar on planning for agricultural marketing development in developing countries of Asia and Pacific. FAO, Bangkok, Thailand, Dec. 2-6.
4. Bogahawatte, C. - First world buffaloe congress. Cairo, Egypt. Dec. 27 - 31.
5. Fernando, J.V. - Agrinet meeting. NAFESA, Colombo, May 20.
6. Gunasena, H.P.M. - IDRC Consultative group workshop on manpower development. Thailand, April 7 - 14.
7. Gunasena, H.P.M. - Seminar on current research in winged bean, SLAAS Section B. International Winged-Bean Institute, Pallekelle, June 14.
8. Gunasekera, K.G.A. - Workshop on research priorities for irrigation management in Asia. Lahore, Pakistan, Jan. 6 - 7.
9. Gunawardena, E.R.N. - International workshop on exchange of experience in operational application of mathematical models (surface water) in developing countries. I.I.T, New Delhi, Feb. 26 - March 1.
10. Gunawardena, E.R.N. - Workshop on computer application in agriculture. BMICH, Colombo, May 22.

12. Herath, H.M.G. - Workshop on research priorities for irrigation management. Lahore, Pakistan, Jan. 5 - 9.
13. Herath, H.M.G. - Seminar on higher agricultural education and agricultural development. SEARCA, Los Banos, Philippines, July 15 - 30.
14. Herath, H.M.G. - Seminar on land settlement experiences 1978 - 1985. Ladyhill Hotel, Kandy, Aug. 29 - 31.
14. Herath, H.M.G. - Risk analysis workshop. Hyderabad, India Oct. 27 - Nov. 2.
15. Jayasena, W.V. and Mapa, R.B. - Statistics and computer application in agriculture conducted jointly by the Department of Statistics and Computer Science, University of Colombo and the Statistical Service Center, Department of Applied Statistics, University of Reading. Nov. 25 - Dec. 24.
16. Kailasapathy, K. - Fifth Indian Convention of Food Scientists and Technologists. New Delhi, India, April 3 - 5.
17. Keerthisinghe, G. - Seminar on the role of chemistry in agricultural development. Institute of Chemistry C.A.R.I., Gannoruwa, Feb. 13.
19. Keerthisinghe, G. and Thenabadu, M.W. - Seminar on the C.I.D.A. - funded research projects in Sri Lanka. NARESA, Colombo, Feb. 22.
20. Keerthisinghe, G. - Colloquium on energy flux at the soil atmosphere interface. International Institute for Theoretical physics. Trieste, Italy, April 15-May 3.

20. Keerthisinghe, G. - 19th colloquium of the International Potash Institute on potassium in the agricultural systems of the humid tropics. Bangkok, Nov. 25-29.
21. Panditharatne, S. - FAO/IAEA inter-regional training course on the use of isotope - aided techniques in ruminant nutrition. IAEA, Vienna, Austria, Aug. 25 - Sept. 20.
22. Premaratne, K.P., Sangakkara, U.R. and Gunasena, H.P.M. - Seminar on the CIDA funded research projects in Sri Lanka. NARESA, Colombo, Feb. 22.
23. Premaratne, K.P. - Seminar on marketing and quality control of agricultural products. Technical University of West Berlin, Federal Republic of Germany, June 14-31.
24. Rajaguru, A.S.B. - Seminar on the morphology of native livestock in Asia. University of Kyoto, Japan. Nov. 18-26.
25. Samarajeewa, U. - Seminar on chemistry in agriculture. The Institute of Chemistry, Ceylon at CARI, Gannoruwa, Feb. 11.
26. Samarajeewa, U. - Workshop on microcomputers in laboratory automation. National University of Singapore, Singapore, April 12 - 17.
27. Samarajeewa, U. - Research colloquium of the Institute of Fundamental Studies, May 8.

29. Samarajeewa, U. - Workshop on agriculture, nutrition and rural development, London School of Hygiene and Tropical Medicine and University of East Anglia, UK. June 24 - July 26.
30. Senanayake, Y.D.A. - Seminar on strengthening national agricultural research systems: An approach and priorities. IWMAR, Netherlands, Jan. 21 - 25.
31. Senanayake, Y.D.A. - Recent research on plantation crops. SLAAS Section B, Colombo, April 26.
32. Senanayake, Y.D.A. - Recent research on winged bean. SLAAS Section B. International Winged Bean Institute, Pallekelle, June 14.
33. Sivayoganathan, C. - Training course in agricultural extension services. Rural Development Administration, The Republic of Korea. Aug. 5 - 24.
34. Thenabadu, M.W. - Seminar on the role of chemistry in agricultural development. Institute of Chemistry, Ceylon at CARI, Gannoruwa, Feb. 15.
35. Wickramasinghe, I.P. - Seminar on recent research on winged bean. SLAAS Section B, International Winged Bean Institute, Pallekelle, June 14.
36. Yapa, L.G. - Recent research on winged bean. SLAAS Section B, International Winged Bean Institute, Pallekelle, June 14.
37. Yapa, L.G.G. - Annual scientific conferences on soils and plant nutrition. Agricultural Research Center, Sapporo, Japan, Dec. 6.

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ANNEX 7

Memorandum of Understanding and Implementing Strategy

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE POSTGRADUATE INSTITUTE OF AGRICULTURE
THE FACULTY OF AGRICULTURE
UNIVERSITY OF PERADENIYA
KANDY, SRI LANKA
AND
THE COLLEGE OF AGRICULTURE
PENNSYLVANIA STATE UNIVERSITY
STATE COLLEGE, PENNSYLVANIA, USA
AND
THE COLLEGE OF AGRICULTURE
TEXAS A&M UNIVERSITY
COLLEGE STATION, TEXAS, USA
AND
THE COLLEGE OF AGRICULTURE & LIFE SCIENCES
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
BLACKSBURG, VIRGINIA, USA

* * * * *

THE POSTGRADUATE INSTITUTE OF AGRICULTURE AND THE FACULTY OF AGRICULTURE,
UNIVERSITY OF PERADENIYA; THE COLLEGE OF AGRICULTURE, TEXAS A&M
UNIVERSITY; THE COLLEGE OF AGRICULTURE, PENNSYLVANIA STATE UNIVERSITY;
THE COLLEGE OF AGRICULTURE AND LIFE SCIENCES, VIRGINIA POLYTECHNIC
INSTITUTE AND STATE UNIVERSITY OF THE UNITED STATES OF AMERICA.
HEREINAFTER REFERRED TO AS "THE PARTIES."

WHEREAS:

TECHNOLOGY EXCHANGE IS NECESSARY TO REACH DEVELOPMENT AND TECHNICAL
SELF-EFFICIENCY WHICH WILL ALLOW THE CONSERVATION AND UTILIZATION OF
AGRICULTURAL PRODUCTS AND NATURAL RESOURCES.

COOPERATION ON AGRICULTURE AND FOOD MATTERS WITH THE UNIVERSITY OF
PERADENIYA HAS BEEN STRENGTHENED THROUGH THE SIGNING OF THE CONTRACT
BETWEEN THE ACADEMY FOR EDUCATIONAL DEVELOPMENT; PENNSYLVANIA STATE
UNIVERSITY; TEXAS A&M UNIVERSITY; AND VIRGINIA POLYTECHNIC INSTITUTE AND
STATE UNIVERSITY.

SCIENTIFIC AND TECHNICAL INVESTIGATION IN FIELDS OF MUTUAL INTEREST
COULD CONTINUE TO GENERATE BENEFICIAL RESULTS IN THE EXCHANGE OF
AGRICULTURAL DEVELOPMENT PLANS WHICH ARE BEING DEVELOPED BY THE PARTIES.

THE PARTIES HAVE AGREED TO THE FOLLOWING:

ARTICLE 1

ESTABLISH AND CARRY OUT JOINT PROGRAMS (SUBJECT TO RESOURCE AVAIL-
ABILITY) ON SCIENTIFIC AND TECHNOLOGICAL COOPERATION IN SPECIFIC AREAS
OF MUTUAL INTEREST OF AGRICULTURE AND FOOD; TO STRENGTHEN INSTRUCTION,
RESEARCH, AND EXTENSION IN THE FIELDS OF AGRICULTURE AND RELATED
STUDIES.

ARTICLE 2

THE ANNUAL WORK PROGRAMS CONSTITUTE THE UNDERLYING FOUNDATION OF COOP-
ERATION PROVIDED FOR BY THIS MEMORANDUM FOR THE FULFILLMENT OF THEIR
GOALS; SAID PROGRAMS WILL BE ELABORATED BY COMMON AGREEMENT BETWEEN THE
PARTIES, AND SHOULD INCLUDE:

- A) DEFINITION OF OBJECTIVES, REFERENCE TERMS, GOALS AND SPECIFIC
PURPOSES TO BE ATTAINED;
- B) PROCESS-METHODOLOGY TO BE FOLLOWED IN THE PROGRESSIVE REALIZATION OF
THE GOALS WHICH HAVE BEEN PROGRAMMED;
- C) RESPONSIBILITY FOR EVERY PHASE OF THE PROJECT;
- D) TIMETABLE FOR THE BEGINNING AND TERMINATION OF THE PROJECT;
- E) RECIPROCAL INTEREST AND AVAILABLE RESOURCES, HUMAN AND FINANCIAL;
- F) OUTLINE FOR THE SURVEILLANCE AND EVALUATION OF THE PROJECT;
- G) APPROVAL, EXECUTION AND FULFILLMENT OF OPERATIONAL PROCESS;

- H) DISPOSITION, PUBLICATION AND/OR OTHER MEANS OF DISSEMINATION OF THE FINDINGS AND RESULTS ACHIEVED AT THE TERMINATION OF THE PROJECT.

ARTICLE 3

THE COOPERATION CHARACTERISTICS BETWEEN THE PARTIES MAY INCLUDE:

- A) STUDENTS, SCIENTISTS AND SPECIALISTS EXCHANGE;
- B) TECHNICAL AND SCIENTIFIC INFORMATION EXCHANGE;
- C) ORGANIZATION OF SYMPOSIUMS AND CONFERENCES ON PROBLEMS OF INTEREST TO THE PARTIES;
- D) JOINT INVESTIGATION OF TECHNICAL AND SCIENTIFIC PROBLEMS WITH POSSIBLE SUBSEQUENT IMPLEMENTATION OF THE RESULTS OF THIS WORK IN ITS PRACTICAL APPLICATION.

ARTICLE 4

IN ORDER TO FACILITATE THE COOPERATION PROVIDED FOR BY THIS MEMORANDUM, THE PARTIES WILL EACH HAVE AN ACTIVITIES COORDINATOR, TO ELABORATE, CONDUCT, AND REVIEW THE PROGRESS OF THE ACTIVITIES STIPULATED IN THIS MEMORANDUM.

THE COORDINATOR WILL BE RESPONSIBLE FOR THE EXECUTION OF THE SPECIFIC COOPERATION ACTIONS OF THE PARTY REPRESENTED UNDER THIS MEMORANDUM.

THE COORDINATORS REPRESENTING THE FACULTY OF AGRICULTURE AND THE POST-GRADUATE INSTITUTE OF AGRICULTURE, AND THE COLLEGES OF AGRICULTURE, PENNSYLVANIA STATE UNIVERSITY, TEXAS A&M UNIVERSITY, AND VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY, WILL BE THE DEAN OF EACH COLLEGE OR DESIGNATED REPRESENTATIVE.

ARTICLE 5

THE PARTIES MUST FORMULATE ANNUAL REPORTS FOR INTERNATIONAL PURPOSES ON THE PROGRESS AND ACHIEVEMENTS MADE UNDER THE PRESENT MEMORANDUM.

ARTICLE 6

THE ENTRY INTO THE COUNTRIES OF THE EQUIPMENT AND STAFF NECESSARY TO ACHIEVE THE OBJECTIVES OF THE PRESENT MEMORANDUM WILL BE CARRIED OUT IN ACCORDANCE TO NATIONAL RELEVANT LAWS AND AGREEMENT BETWEEN THE TWO COUNTRIES.

ARTICLE 7

BY COMMON AGREEMENT, THE PARTIES MAY INVITE OTHER NATIONAL INSTITUTIONS AS WELL AS SCIENTIFIC, ACADEMIC OR COMMERCIAL COMMUNITIES TO PARTICIPATE IN THE ANTICIPATED COOPERATIVE ACTIONS PROVIDED FOR IN THE IMPLEMENTATION OF THIS MEMORANDUM, TO WHICH EFFECT THE PARTIES WILL ENCOURAGE AND FACILITATE CONTACTS BETWEEN INSTITUTIONS AND SPECIALISTS.

ARTICLE 8

THE PARTIES WILL BE ABLE TO MAKE AVAILABLE FOR THE INTERNATIONAL SCIENTIFIC COMMUNITY, THE INFORMATION DERIVED FROM THE COOPERATIVE ACTION UNDER THE PRESENT MEMORANDUM, BY MUTUAL AGREEMENT.

ARTICLE 9

HUMAN, MATERIAL, TECHNOLOGICAL, AND FINANCIAL RESOURCES NECESSARY IN THE EXECUTION OF PROJECTS ARE TO BE DEVELOPED UNDER THE TERMS OF THIS MEMORANDUM AS RESOURCES ARE OBTAINED AND AVAILABLE.

ARTICLE 10

THE PRESENT MEMORANDUM WILL ENTER INTO FORCE UPON SIGNATURE AND REMAIN VALID FOR 5 YEARS AND MAY BE RENEWED FOR EQUAL DURATION PERIODS, BY AN EXCHANGE OF NOTES BETWEEN THE PARTIES, THREE MONTHS PRIOR TO THE EXPIRATION DATE, UNLESS TERMINATED BY EITHER PARTY UPON SIX-MONTHS WRITTEN NOTICE.

ARTICLE 11

THE PRESENT MEMORANDUM MAY BE MODIFIED OR AMENDED BY THE PARTIES' MUTUAL AGREEMENT AND THE MODIFICATIONS OR AMENDMENTS WILL ENTER INTO FORCE AS OF THE DATE OF THEIR APPROVAL AND MUTUAL NOTIFICATION.

THE EXPIRATION OF THE PRESENT MEMORANDUM WILL NOT AFFECT THE EXISTING ACTIVITIES PREVIOUSLY APPROVED BY THE PARTIES.

SIGNED THIS 5th DAY OF JUNE OF NINETEEN HUNDRED AND EIGHTY-SIX.

BY THE DIRECTOR OF THE POSTGRADUATE INSTITUTE OF AGRICULTURE

[Signature]

BY THE DEAN OF THE FACULTY OF AGRICULTURE UNIVERSITY OF PERADENIYA

[Signature]

BY THE VICE-CHANCELLOR UNIVERSITY OF PERADENIYA

[Signature]

BY THE DEAN OF THE COLLEGE OF AGRICULTURE, PENNSYLVANIA STATE UNIVERSITY

[Signature]

BY THE DEAN OF THE COLLEGE OF AGRICULTURE, TEXAS A&M UNIVERSITY

[Signature]

BY THE VICE PRESIDENT FOR INTERNATIONAL PROGRAMS OF PENNSYLVANIA STATE UNIVERSITY

[Signature]

BY THE PRESIDENT OF TEXAS A&M UNIVERSITY

[Signature]

BY THE DEAN OF THE COLLEGE OF AGRICULTURE & LIFE SCIENCES VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

[Signature]

BY THE PRESIDENT OF VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

[Signature]

June 25 1986
DATE SIGNED BY ALL PARTIES

Implementation Strategy for Memorandum of Understanding

**TENTATIVE IMPLEMENTING STRATEGY FOR MEMORANDUM OF UNDERSTANDING
BETWEEN FACULTY OF AGRICULTURE AND THE POSTGRADUATE INSTITUTE OF
AGRICULTURE OF THE UNIVERSITY OF PERADENIYA AND THE ACADEMY
FOR EDUCATIONAL DEVELOPMENT, INC., THE PENNSYLVANIA STATE
UNIVERSITY, TEXAS A & M UNIVERSITY, AND THE VIRGINIA
POLYTECHNIC INSTITUTE AND STATE UNIVERSITY**

The Memorandum of Understanding, dated June 5, 1986, which was developed by the participating members of the Consortium Council of the Agricultural Education Development Project provides the general parameters for a cooperative linkage agreement. The purpose of this statement is to provide example of the kinds of activities envisioned in the implementation of the basic linkage agreement. Three caveats should be stressed:

- 1) the tentative nature of this implementing strategy and the need for its acceptance by all participating institutions;
- 2) individual implementation orders would be negotiated and signed by PGIA/FA, and one or all of the Consortium members before there is a significant commitment of funding to a specific linkage activity; and
- 3) the implementation strategy is neither inclusive of all activities or exclusive of activities that may be devised.

*

Joint Research Projects

The Consortium members acknowledge the importance of continuing the process of strengthening the research/teaching at the PGIA/FA. It is believed that this can best be accomplished through a program of collaborative research/teaching between the PGIA/FA and the Consortium Universities. To the extent possible the Consortium Universities will respond to all proposals for collaborative research/teaching submitted by the PGIA/FA. This response will include a sharing of information on sources of funding, identifying other faculty members interested in that area of research/teaching, and a professional critique of the submitted proposal. To assist in implementing this process the Consortium Universities will send a list of their active research projects with name of principal investigators and their departmental association. It is hoped that a similar list of current and proposed research programmes will be provided by the PGIA/FA to stimulate closer collaboration between interested faculty members in departments of the Consortium Universities and the PGIA/FA.

*

Staff Training

The Consortium Universities will provide special consideration in reviewing the applications of Sri Lankan candidates sponsored by PGIA/FA for cooperative programs at all levels -- including senior staff and administration of the PGIA/FA. The special knowledge gained from long association of the Consortium Universities with PGIA/FA, should enhance the feasibility of granting scholarships and assistantships or postdoctoral fellowships to Sri Lankan candidates -- within the parameters of the general caveat concerning departmental approval and the availability of funding.

* Curriculum Revision

The Consortium Universities will, upon request, provide assistance in reviewing proposed curricula and syllabi being developed or modified by the PGIA/FA. A large number of faculty members from the Consortium Universities will have first hand knowledge of the PGIA/FA. This will mean that the proposal will typically be reviewed by someone from the Consortium Universities who has worked in Sri Lanka.

* Short-Term Assignments

If interested members of the PGIA/FA faculty will submit a copy of their curriculum vitae to each member of the Consortium, they will be considered as possible candidates for short-term assignments in other development projects being implemented by the Consortium members. These consulting assignments will give the faculty additional professional experience and exposure in other developing nations.

* Reciprocal Educational Opportunities Abroad

The PGIA/FA has been identified as a "Center of Excellence" in agricultural education in Southeast Asia. As such, it will be promoted to students at the Consortium Universities as a site to gain knowledge and exposure in a developing nation and where they will be receiving top level education. When it seems mutually beneficial to PGIA/FA and the students at the Consortium Universities, they will be encouraged to apply to the PGIA/FA for instruction.

* Library Development

The Consortium will continue beyond the project completion date its current policy of submitting a periodic listing of recent library acquisitions in the field of agriculture.

* Computer Facilities

The Consortium Universities will provide, as requested, copies of appropriate public domain computer software programs relevant to the PGIA/FA. In order to be able to do so the PGIA/FA should keep the Consortium Universities informed of their latest interests and/or research projects.

* Short-Term Courses

As a support mechanism to other linkage activities, the Consortium Universities will entertain proposals to provide a limited number of short term courses in areas such as management, administration, computer skills, and teaching methods for the staff of PGIA/FA. It is expected these courses will be supported by extramural funds or grants to bring the PGIA/FA faculty members to the United States and provide for their per diem costs and other relevant costs.

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Conferences and Seminars

The Consortium members will provide copies of announcements of conferences and professional seminars of interest to the PGIA/FA. It is expected that the PGIA/FA will, in a reciprocal manner, provide similar information regarding conferences and seminars of interest organized in the region.

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Communication

The Consortium members will continue periodic professional contacts with the PGIA/FA. These contacts will be in the form of college publications and newsletters, alumni news, mailing of course catalogues, and providing copies of selected articles and special papers of interest to the PGIA/FA. As feasible, periodic visits to Sri Lanka will be made by representatives of the Consortium to discuss items of mutual interests of the PGIA/FA staff.