SWAZILAND

CROPPING SYSTEMS RESEARCH AND EXTENSION TRAINING PROJECT

(AID645-0212)

AN EVALUATION

The Project Is a Cooperative Activity

between

The Ministry of Agriculture and Cooperatives,

Government of Swaziland,

and

The United States Agency for

International Development

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ACRONYMS

AATO ..... Assistant Agricultural Training Officer

ADB ..... African Development Bank

ADO ..... Agricultural Development Officer

AID ..... Agency for International Development

AIO ..... Agricultural Information Officer

AIS ..... Agricultural Information Service

ATO ..... Agricultural Training Officer

BIFAD ..... Board for International Food and Agricultural Development

CCU ..... Central Cooperative Union

CDSS ..... Country Development Strategy Statement

CIAT ..... Center for International Tropical Agriculture

CID ..... Consortium for International Development

CIMMYT ..... International Center for Maize and Wheat Improvement

CIP ..... International Potato Center

C-O-P ..... Chief-of-Party

CPC ..... Chief Project Coordinator

CRDB ..... Central Rural Development Board

CRIES ..... Comprehensive Resource Inventory and Evaluation System

CSR ..... Cropping Systems Research

CSR/E ..... Cropping Systems Research/Extension

CY ..... Crop Year

DIU ..... Development Information Utilization Service

E&T ..... Establishment and Training

EO ..... Extension Officer (used as FO)

EOP ..... End of Project

EW ..... Extension Worker (generalist)

FSR ..... Farming Systems Research

FSR/E ..... Farming Systems Research and Extension

FTC ..... Farmer Training Center

GNP ..... Gross National Product

GOS ..... Government of Swaziland

IARC ..... International Agricultural Research Center

IBRD ..... International Bank for Reconstruction and Development

ICARDA ..... International Center for Agricultural Research in the Dry Areas

IFAD ..... International Federation for Agricultural Development

IITA ..... International Institute of Tropical Agriculture

ILCA ..... International Livestock Center for Africa

ILRAD ..... International Laboratory for Research on Animal Diseases

IRRI ..... International Rice Research Institute

LOP ..... Life of Project

MOAC ..... Ministry of Agriculture and Cooperatives

MRS ..... Malkerns Research Station

NCSU ..... North Carolina State University

OSARAC ..... Office of Southern Africa Regional Activities Coordinator

PACD ..... Project Assistance Completion Date

PCV ..... Peace Crops Volunteer

Penn State ... The Pennsylvania State University

PID ..... Project Identification Document

PM ..... Project Manager

PP ..... Project Paper

Pro Ag ..... Project Agreement

PSU ..... The Pennsylvania State University

RA ..... Research Assistant

RDA ..... Rural Development Area

RO ..... Research Officer

RSA ..... Republic of South Africa

SADCC ..... Southern Africa Development Coordination Conference

SAO ..... Senior Agricultural Officer

SEO ..... Senior Extension Officer

SIMPA ..... Swaziland Institute of Management and Public Affairs

SMS ..... Subject Matter Specialist

SNL ..... Swazi Nation Land

TA ..... Technical Assistance

T&V ..... Training and Visit System

TSU ..... Tennessee State University

UG ..... University of Georgia

UM ..... University of Missouri

UNISWA ..... University of Swaziland

USAID ..... United States Agency for International Development, Mission to Swaziland

USAID/W ..... United States Agency for International Development, Washington, D.C.

I. EXECUTIVE SUMMARY AND MAJOR RECOMMENDATIONS

A. Introduction

The Swaziland Cropping Systems Research and Extension (CSR/E) Training Project is a cooperative venture between the Government of Swaziland (GOS) and the United States Agency for International Development (USAID). The project is based on a Project Paper (PP) prepared in 1980 and submitted to the AID administrator in August 1981.

The 5-year project encompasses USAID's major response to requests for assistance from GOS in its efforts to raise the productivity of homestead families residing on the Swazi Nation Land (SNL), to increase their incomes, and to improve the economic viability of farming on SNL. About two-thirds of Swaziland's population resides on the SNL, and they are, in general, the poorer people of the country. In 1979, per capita real income was $200 (estimated), of which $55 was cash income.

The Ministry of Agriculture and Cooperatives (MOAC) is the implementing agency for the project. USAID is providing technical assistance, construction, and commodities to improve the capabilities of two MOAC Departments (Directorates)--Research and Planning and Agriculture. The United States Peace Corps, through an agreement with GOS, is providing volunteers (PCVs).

The project purposes are to be achieved by:

1. Developing recommendations for innovations and improved cropping

practices for SNL homesteaders/farmers which are practical, within their means, and readily acceptable; and

2. Delivering the recommendations and securing their adoption by a rapidly increasing percentage of the SNL homesteaders/farmers.

The project is to achieve its purposes by outputs produced from inputs contributed by USAID costing about $13 million, by GOS costing about $4.5 million, and by four PCVs from the United States Peace Corps through an agreement with GOS.

The PP calls for two internal project reviews and an external evaluation. The first review was rather informal, and USAID concluded the second review and external evaluation should be combined. The evaluation was conducted in November and December 1984. The basis for the evaluation was the logical framework for the project. The logical framework is a planning, implementation, management, and evaluation mechanism used in all projects to which AID makes a major contribution.

B. Project Goal

The Evaluation Team reviewed the project setting to determine whether changes which occurred between the time of the project design and the present call for major revisions in the project. The team reviewed project progress and attempted to determine: Causes for any shortfalls in delivery of inputs; whether the outputs planned in the PP were likely to be produced; and whether production of the outputs would cause the project purpose and, finally, the goal to be achieved.

The Evaluation Team concluded that the stated goal for the project, namely, "to increase the economic viability of farming on SNL," was a very appropriate one for a joint effort between the Governments of the United States and Swaziland when the project was planned, and it is even more appropriate now. In general, the CSR/E is a good project which merits being given top priority, full support, and total commitment by GOS and USAID. If the project is successful, the quality of life for at least half of the citizenry of Swaziland will be enhanced. The project's goals and purpose are 100 percent consistent with the stated policies of both GOS and USAID.

While the project's goals are laudable and remain very desirable, the Evaluation Team found that the objectively verifiable indicators for the goal in the PP were no longer adequate due to lessons learned within the project and from similar projects in other developing countries. The team recommends the following changes.

Recommendation: Update the project design by adding verifiable indicators which measure change from the holistic perspective of the homesteader/farmer.

Time has demonstrated that the assumptions, on which goal achievement from the project purpose were based, are no longer sound; therefore, corrective action is needed at this time. It was assumed the marketing systems would accommodate increases in production for the market. It is now very clear that the market for corn is very restricted, and the markets for other products, such as vegetables and livestock, are very uncertain and unreliable. Marketing and storage are definitely constraints to project progress, and will

become increasingly so. Marketing is not an internal project problem, but the project cannot logically be expected to reach its goal without major improvements in it.

Recommendation: GOS should take action to improve the marketing system for products produced on SNL.

Another assumption on which meeting the project goal was based is that GOS policies will encourage crop production for the market. The record is good, but the Evaluation Team feels greater effort should be made in the future. In order to provide the economic environment needed to encourage substantial increases in production for the market, GOS may need technical assistance and the team took this into account.

Recommendation: GOS should request, and USAID should give, favorable consideration to providing whatever technical assistance (TA) in policy and administration is needed by the MOAC . It would be preferable for the TA to be provided external to the CSR/E Project, but it is acceptable to revise/ amend the project and include it.

C. Project Purpose

The stated purpose of the project is "to improve and expand the capacity of the MOAC research and extension program to develop and effectively extend cropping systems recommendations relevant to the economic needs of the SNL farmer."

The Evaluation Team commends all parties for what has been accomplished. To date, the project has gone well in terms of meeting the stated purpose. The Evaluation Team determined that changes which have occurred in the project setting since the inception of the project do not call for alteration in the project purpose, but, from this point in time forward, how it is interpreted should be updated and accepted by all parties. Project experience, to date, demonstrates that livestock cannot be ignored if a bona fide systems approach is utilized, and it was further ascertained by the Evaluation Team that the best, if not the only, hope for researchers producing recommendations which are relevant, and thus will be accepted by the SNL homesteaders/farmers, is to analyze their situation from a holistic viewpoint, using systems analysis. Both researchers and extensionists must use a whole farm/family approach. Therefore, the Evaluation Team has concluded that livestock must be included in the project; however, the project should continue to give major emphasis to cropping.

What has been learned is no surprise. The design team for the project recognized the critical role livestock play for the SNL homesteaders. The team even stated livestock could not be ignored if a systems approach was to be utilized and sound recommendations prepared.

The critical, practical problem is money and resources. The USAID commitment is probably not sufficient to include a full-fledged livestock component, and the Evaluation Team does not believe initiating large scale, across-the-board livestock investigations/research at this time represents a wise use of GOS's limited governmental revenues. With this in mind, four closely related recommendations have been crafted.

Recommendations:

1. The Cropping Systems Research and Extension Training Project approach to both research and extension should hereafter be the holistic Farming Systems Research and Extension (FSR/E) approach. (In the Evaluation Report, whenever the approach of the project in the future was under discussion, it was abbreviated FSR/E to signify that the holistic farm unit was to be the basis for analysis.)

2. The project should continue to stress crops, partially because progress to date is greater there and recommendations should be forthcoming very soon.

3. Livestock research/extension should be limited for the remainder of the project to those aspects directly affecting and vital to the utilization of the farming systems, i.e., FSR/E, approach.

4. A full-fledged livestock research program is not economically justifiable at this time.

Good progress has been made by the GOS and USAID contractor team members assigned to the project in terms of reaching targets established for the verifiable indicators. Much research is being conducted on-farm, and several effective recommendations are in sight. The project is beginning to produce the kind of results anticipated in the beginning. In agricultural information and extension training, progress is now good after a slow start. Research-extension organizational linkages are behind schedule, and immediate attention is required.

Problems which need attention have been encountered or seem to be emerging in the assumptions which underpin the achievement of the project purpose. It was

assumed adequate financial resources would be made available to meet MOAC recurrent costs, and participants would return and remain in the staff positions for which they were trained. To date, 50 percent of the long-term trainee participants have left the project; and MOAC, as an unplanned result of the worldwide recession, is facing difficult times financially. The most critical problem is the present and anticipated loss of Swazi personnel trained under project auspices. The project cannot meet its purpose or achieve its goal if well-qualified Swazis do not remain in the employ of the Research and Planning Department and the Agriculture Department.

Recommendations:

1. GOS must create a work environment which will retain the well-trained personnel needed to create an effective research and extension program capable of utilizing the FSR/E approach. (More will be said later on this topic.)

2. The Project Team (including both Swazi and ex-patriate members) should be careful not to develop institutions or plan programs which are beyond the financial resources GOS will likely be able to provide in the years ahead.

3. GOS should give high priority to the project because, if it is well managed, it will likely improve the national economic base and in the long run, yield a high benefit to cost ratio.

While much progress has been made toward achieving the project purpose, to date is seems the project has largely been an "American" (USAID-Contractor Team) effort, and hereafter, it is vital that major attention be given to institutionalization. By the end of the project, Swazis must have accepted the FSR/E approach and be capable of carrying forward without the help of expatriates. The project has reached a stage where a change in priorities for activities is needed.

The Evaluation Team concluded that the FSR/E approach and the program being developed by the CSR/E Project should be the keystone in the Swazi research-extension system in the years ahead, and they were pleased to hear that the same conclusion had been reached by the top echelon administrators in MOAC. The Evaluation Team was told the conclusions in the Swaziland Government Report on the Seminar on Rural Development Strategies for the Next Decade: 1984-1994 represented the GOS's positions and policies. The conclusions are excellent; the strategy is right on target. The Evaluation Team commends MOAC higher administrators.

Unfortunately, the Evaluation Team determined that the decisions and policies which apparently have been agreed upon at the highest levels have not been communicated to the working levels. There is much confusion and uncertainty, which in light of the decisions already made at the higher levels and strategy agreed upon, seems unnecessary. For example, the Evaluation Team found that Swazi research personnel do not view the CSR/E Project as being the wave of the future. They do not see working in CSR/E as being something vital to their promotions and in their best career interests. Extension workers feel similarly.

Recommendation: MOAC officials should clearly communicate to all levels what role they expect FSR/E to play in Swaziland in the future.

D. Outputs

Fifteen outputs are listed in the PP, and they are appropriate. The Evaluation Team determined that very good progress has been made in terms of

reaching the verifiable indicators. In general, the project is about where it should be at this time, but there is room for improvement.

Looking to the future, the Evaluation Team feels action should be taken to implement the recommendations listed above with regard to the project purpose, and this will reveal a need for some revisions in the outputs. The changes required in outputs are very modest.

Recommendations:

1. Revise outputs to include those needed to utilize a bona fide FSR/E approach, but in accordance with the PP, continue to emphasize cropping for the remainder of the project.

2. Conduct research and validation trials in all nine of the main areas in the revised Rural Development Areas (RDAs) Program (see Seminar Report cited above) and develop recommendations for all areas.

3. Include livestock outputs as required in recommendations cited under "Project Purpose" above.

Two problems were discovered in the assumptions in the project plan which were made relative to achieving the output targets. If not corrected, the Evaluation Team is quite certain the project ultimately will not be successful in terms of achieving its purpose or reaching the goal. Finding solutions should be given highest priority by MOAC--specifically, the Research and Planning Department and the Agriculture Department. USAID and the USAID Contractor Team personnel should help if they can. The problems are that GOS has not established the required posts and posts essential to the project are not being filled by qualifed Swazis because those trained are leaving governmental service or being transferred. A closely related, but equally

serious, threat to project success is that current post descriptions for researchers and extensionists do not take into account the requirements for utilizing an FSR/E approach. This applies to higher level Research Officers and to lower level technicians, such as Research Assistants (RAs), as well as corollary level personnel in extension. In extension, a career ladder exists, but it does not in research, especially for the RAs.

Recommendations:

1. The Department of Research and Planning and the Department of Agriculture should establish posts of the type needed.

2. MOAC should take action which will retain the services of well-qualified Swazis, especially those trained for specific project posts.

3. Job descriptions for researchers and extensionists should be revised to reflect the role and duties required in FSR/E.

E. Inputs

All parties have done well in terms of inputs provided. The project is approximately where it should be at this time. The delays and shortfalls which have occurred have been about what the Evaluation Team feels is normal and should be expected under the circumstances. The Evaluation Team commends GOS, USAID, The Pennsylvania State University (Penn State), and the U.S. Peace Corps.

GOS has done well in terms of the provision of its inputs, but from time to time, there have been delays. At present, the budget for recurrent costs is squeezed, and this could become serious if not corrected. GOS must create an

environment in which qualified Swazis are retained by the project and will carry the work forward after the project ends. Recommendations earlier in this report cover these emerging problems.

The U.S. Peace Corps' input contribution has been excellent. Those positions filled by PCVs at present in which the work could be done by Swazis should be phased out soon. However, there will be a continuing role for PCVs, especially as "extenders" for the efforts of the contractor experts and to interface with Swazis.

USAID's inputs have been provided largely through a Title XII contract with The Pennsylvania State University as the prime contractor and Tennessee State University contributing through a subcontract. The collaborative mode of contracting was used and Penn State* participated in the project design. The main ingredient in the contract is the provision of personnel to provide technical assistance. Construction, a minor but vital USAID input, has been provided by USAID outside the Title XII contract.

While progress in USAID's input delivery has been good, the project is now at a turning point and several aspects of performance under the contract and elsewhere are due mid-term corrections. First, most members of the initial Contractor Team had very limited or no prior experience with farming systems methodology, which utilizes a holistic systems-oriented approach. Although the team received some training from CIMMYT FSR/E experts serving east and southern Africa, initial progress was slower than had been anticipated in the

*Hereafter, the term "Penn State" refers to the contracting entity, and Tennessee State University is presumed to be involved.

PP. Assigning personnel with limited or no FSR/E training or experience may have been acceptablein the early stage of the project; however, from this point forward, it is not. CSR/E is a farming systems oriented project, and both USAID and GOS should expect appropriate experience and training in personnel assigned by the contractor. As the project is revised to take livestock into account and build on experiences in similar projects elsewhere in Africa, it becomes even more important that every contractor team member be trained and/or experienced in FSR/E.

To date, none of the Swazi participants receiving academic training have received training in farming systems before returning to Swaziland. The training seems to be standard brand commodity and discipline oriented. This does not meet the needs of the project. Immediate correction is required if the project is to achieve its purpose.

The Contractor Team in the field has done a very commendable job, but few tenured, regular faculty from the contractor or sub-contractor have been assigned. Whether the linkage envisioned in the Title XII legislation is being followed? formed is open to question. The contractor, Penn State, is a stellar institution and the faculty includes many who are creditable on a worldwide basis. With Tennessee State's commitment to provide support, there should be no reason for the contractor to fail to provide the personnel and backstopping needed. A reasonable share of the personnel assigned to the contract should be regular faculty members. With this in mind, several questions need answering. Do the contractor and sub-contractor have the type of personnel required? Do their policies encourage the best personnel on regular faculty appointments to serve overseas? Is overseas service given full consideration

in promotions, tenure, and initial appointments? Is the contractor and its affiliate using the contract to fullest advantage by using staffing as an opportunity to bring well-qualified people into the university system and, after service in Swaziland, entering them into tenure track positions?

Three of the Evaluation Team members are experienced university administrators, and they are aware of the problems universities face in staffing international development contracts. The team is aware many tenured faculty members are neither interested nor well qualified for overseas service. The objective of personnel policies should be to staff the contract with the best possible people; however, given the strength of the contractor and the objectives of Title XII legislation, there is great merit in utilizing personnel who have permanent ties to the contracting institution.

Finally, two high-ranking MOAC officials expressed concern about the professional relationships between the expatriate team members and the Swazis assigned to the project. The Swazis felt that they were not being viewed as proper representatives of the agency that has the basic responsibility for implementing the project. A slight "we and them" feeling was noted. The Evaluation Team found the situation confusing and is reluctant to offer specific suggestions. The Evaluation Team found excellent attitudes on the part of every expatriate. The conclusion is that the perception is not an accurate reflection of intent; nevertheless, it <u>is</u> the perception and, as such, is important. The only advice offered is that all parties, including the contractor administrators, should at every opportunity stress that the project is a "Swazi project," i.e., it is not a "USAID" or "Penn State" project in which an institution is being created for "handing over" to the

Swazis. It is important for all parties to the project to recognize that the appropriate heads of the MOAC organizations (Departments) to which all team members are assigned hold the basic responsibility for everything that happens in their organizations (Departments).

The project has great potential. It can be a showpiece for USAID, MOAC, and Penn State. The collaborative mode has worked well so far, and it can work even better. The Evaluation Team urges all parties to provide inputs of the type, quantity, and quality required to make the project achieve its full potential. The following recommendations are intended to be a guide for input delivery.

Recommendations:

1. The project (all parties--MOAC, USAID, Penn State--included) should utilize the farming systems approach as the hard core of the project. Use a multi-disciplinary team approach in all aspects of the project. Staff accordingly.

2. Integrate the extension and research components of the project immediately. "Think and talk" research and extension.

3. The contractor should nominate only highly-qualified personnel with training and experience in farming systems research and extension, and if they are not available, train them before they arrive in Swaziland.

4. Designate one contractor position at Malkerns as being for a farming systems research and extension expert. (The incumbent may serve other project needs, too, but the major assignment should be to guide and monitor the FSR/E thrust.)

5. Provide FSR/E training to all Swazis in academic programs before they return home.

6. Plan and conduct short-term and on-the-job training in Swaziland on FSR/E.

7. The contractor(s) should adopt policies which will lead to top-notch, tenured, world-class personnel from their own campuses being nominated for and accepting appointments on the project. Provide FSR/E training, if needed.

8. The contractor, GOS, and USAID should give higher priority to the impact on linkages between U.S. and Swazi institutions when nominating and approving long and short-term technical assistance personnel.

II. INTRODUCTION AND EVALUATION PROCEDURES

The Swaziland Cropping Systems Research and Extension Training Project (645-0212) is a cooperative venture between the Government of Swaziland and the United States Agency for International Development. The terms of reference for both parties are contained in the Project Paper, and are summarized by AID Assistant Administrator Ruddy in his Action Memorandum for the Administrator, dated August 17, 1981.

The project encompasses USAID's major response to the low productivity and income problem of homesteaders on the Swazi Nation Land. The project plan calls for USAID to contribute about $13 million worth of inputs over a 5-year period; the GOS about $4.5 million; and the Peace Corps, through an agreement with GOS, several volunteers. AID gave the project a Title XII classification, and the collaborative assistance mode is being utilized. On a competitive basis, The Pennsylvania State University, in association with Tennessee State University, was awarded the contract to design and implement most of USAID's contribution. Penn State, as the prime contractor, is responsible for providing all of the technical assistance, training, commodities, equipment, and vehicles; however, through a subcontract with Tennessee State, the latter is expected to provide at least one long-term person. Construction of 14 residences and a few other USAID inputs are not included in the Penn State contract, but are handled "direct" by USAID.

The Ministry of Agriculture and Cooperatives is the implementing agency for the GOS. The project's research component is under the jurisdiction of the

Research and Planning Department (Directorate), and the extension training and agriculture information components are in the Agriculture Department (Directorate).

The Project Paper evaluation plan calls for three evaluations--two internal, to be conducted jointly by the GOS and USAID, and one external. The first internal evaluation was informal, and because of perceived changes in the project setting, the external evaluation was scheduled slightly earlier than planned in the PP, and it was combined with the second internal evaluation.

Three persons completely removed from the project, but with considerable experience in and knowledge of Swaziland agriculture, rural development strategy, and infrastructure were engaged by USAID to serve as the core to conduct the evaluation in collaboration with a representative from the contractor, participation by key personnel from the GOS, and with a representative from the Board for International Food and Agricultural Development (BIFAD), who participated mid-term and counseled on recommendations. This approach was in accordance with principles which have been emerging as greater experience is gained with the Title XII collaborative assistance mode. Representatives from the contractor and the host-country government served primarily in resource roles. The scope of work for the evaluation was prepared by USAID (see Appendix A).

The team consisted of the following:

Dr. Duane Acker--BIFAD Representative; BIFAD Member and President, Kansas State University; background in animal science and higher education administration (research, extension, and resident instruction) in the land-grant mode.

Dr. John Ayers--Contractor Representative; Professor of Plant Pathology and Swaziland Cropping Systems Research and Extension Training Project Director, Pennsylvania State University; background in plant pathology and general plant science.

Dr. John L. Fischer--Agricultural Economist and Evaluation Team Leader; Executive Director, Consortium for International Development; background in agricultural and rural development and administration; extensive international experience.

Mr. Robert McColaugh--Farming Systems Research Specialist and Agronomist; REDSO/East and South Africa, Agency for International Development; background in farming/ranching, development project leadership, and farming systems research/extension.

Dr. Thomas Trail--Extension and Rural Development Specialist; Professor of Adult Education and Staff Development Specialist for Extension, Washington State University; background in rural development, farming systems, and extension; extensive international experience.

The team members used the Log Frame in the PP as the basis for the evaluation, and followed the guidelines for evaluations in AID Handbook 3, Appendix 12-B. They met with the key representatives of the Government of Swaziland and USAID who are involved in the project, and worked closely throughout the evaluation with the Senior Research Officer of the MOAC, who is the GOS administrator responsible for the research component of the project and the counterpart to the Penn State Team's Chief-of-Party (C-O-P). In addition, they also worked closely throughout with the USAID Agriculture Development Officer (ADO) and the Penn State C-O-P. They interviewed all members of the Penn State Team, all available MOAC

counterparts in both the Research and Planning Department and the Agriculture Department, the Research Assistants, the Peace Corps Volunteers assigned to the project, and others with knowledge concerning it. The team members reviewed the on-going research at the Malkerns Station, and traveled extensively, visiting three RDAs and numerous on-farm research sites. At the RDAs, they visited RDA managers, extension personnel, and farmers. Many reports, studies, and project documents were reviewed. Before leaving Swaziland, the team members made oral presentations, and discussed their findings and recommendations with the MOAC higher echelon administrators, the project team members (both Swazi and Penn State), and USAID. This report is viewed as being supplementary to the messages provided in these meetings.

III. BACKGROUND AND DESCRIPTION OF THE PROJECT

A. Background

Dual economies and subsectors are common in developing countries, but Swaziland is unique in the extent and degree to which duality exists. The culture is dual, with very vivid traditional and modern parts. There is a traditional system of government/politics and a modern, westernized system. The land ownership and use pattern is dual, with the situation on the Title Deed lands and individual tenure farms being quite different from those on the Swazi Nation Land. The agri/rural development system is dual, with a strictly commercial and market orientation on the Title Deed lands and individual tenure farms and a subsistence/security net orientation on the homesteads on the Swazi Nation Land.

At the time the Swaziland Cropping Systems Research and Extension Training Project, hereafter referred to as the CSR/E Project, was designed, the Title Deed/individual tenure farms were operated almost entirely by a relatively few expatriates, but they contained about 40 percent of the land area and produced about 60 percent of the agricultural output. The remainder, about 60 percent of the total land area of the Nation, constituted the Swazi Nation Land on which approximately 373,000 people (66 percent of the Swaziland resident population) resided in 42,000 dispersed homesteads. Incomes generated and technology employed by the Title Deed and individual tenure farms/ranches was relatively high, but the real incomes for the 67 percent of the Swaziland resident population residing on the SNL were

low--averaging $200 per capita annually. Cash income was estimated at $55 per capita.

When the CSR/E Project was designed, the decision had been made by GOS to concentrate the efforts of the Ministry of Agriculture and Cooperatives on the Swazi Nation Land because that was where the bulk of the Swazi people were located. This decision provided an environment very amenable to assistance from USAID because it was quite consistent with agency policies at the time.

The agricultural and rural development situation on the SNL presented many challenges. About 87 percent of the SNL was used for communal grazing for 546,000 cattle and 281,000 small ruminents. Cattle were recognized as the "most financially viable store of wealth for the majority of the rural homesteads" (PP, p. 7). About 10 percent of the SNL area was under cultivation, with 3 percent fallow in any given year. The area under cultivation was the prime source of food for the 42,000 homestead families. An important Swaziland national goal was self-sufficiency in food production and another was to increase productivity on the SNL and involve greater numbers of homesteaders in the market economy.

USAID, in accordance with AID policies at the time and in support of the GOS decision to focus on improving the quality of life for the majority of the Swazi citizenry who were poor and resided on the SNL, responded favorably to a request by the GOS to provide technical and other assistance with a "focus on research and extension" (PP, p. 8). Utilizing the Title

XII collaborative assistance mode, USAID selected a prime contractor, namely The Pennsylvania State University, to implement the USAID portion of the project. A design team was fielded by Penn State, and the Project Paper, which was submitted to the AID Administrator on July 6, 1981, was prepared.

The Rural Development Area Program was the keystone in the GOS strategy to increase incomes and improve the general standard of living for the Swazi people residing on the SNL when the CSR/E Project was designed. The RDA Program dates from 1970 when the GOS, with assistance from the United Kingdom, initiated a pilot RDA Project. The basic ingredients in the pilot RDA Project were consistent with the state of the development art in the early 1970s, and the project was well received by the GOS. By the mid-1970s, the GOS had decided to make the area development approach the hard core of its national rural sector development strategy. GOS plans then, as now, called for increasing the area covered by the RDAs until the entire SNL area was included.

At the time of the CSR/E Project design, GOS classified the RDAs in terms of inputs made available for agriculture, and it had a strategy for beginning with the "minimum input" class and then upgrading them. The classification system has been revised and virtually abandoned, but the basic concepts which were the foundation of the RDA approach have been changed very little. While not stated explicitly in the PP, the real purpose of the CSR/E Project was, and remains so today, to backstop the RDA Program. There simply is no other realistic alternative.

Agriculture research was officially begun in Swaziland in 1959 with almost all of it carried out by expatriates on research stations. Most of the research was commodity oriented and focused on monocropping. A modest amount of livestock and range management research was carried out on the Highveld Ranch and at other stations. The research had met the need of the estates and individual tenure farms reasonably well, but unfortunately, extension workers in the RDAs on the SNL did not find the research findings of much utility. The findings were not regarded as meeting the needs of the homesteaders on the SNL, who were the clients of the RDAs and as indicated earlier, constituted 67 percent of the Swaziland population.

While the research program in Swaziland dated from 1959, it was in a state of disarray when the CSR/E PP was prepared. In 1978, major responsibility for agricultural research was transferred from the present-day University College of Swaziland to the MOAC. Thirteen professional positions were to be created, but there were problems and appointments were delayed. By 1979, all but one of the expatriate staff had left the country, and only two Swazis were filling positions.

The extension program which had been developed to backstop the RDA Program on the SNL was relatively well organized and staffed by 1979, but primarily by personnel with limited training. The Design Team concluded that extension was constrained by the lack of training and the availability of materials needed to be effective in improving crop production.

The Design Team concluded that emphasis in the new project, focusing on research and extension and to be funded largely by USAID, should be on

increasing the production and productivity of crops. While the areas tilled were small for each homesteader, the PP Team believed productivity could be improved and marketable surpluses produced. Livestock were recognized as being important to the homesteaders, but it was decided to restrict the project to crops for several good reasons.

A systems approach to cropping research, wherein much of it is conducted on the homesteaders' land, was regarded by the Design Team as the best way to assure appropriateness of the research program, and presumably to minimize costs too. The team concluded extension required assistance too, and priority needs there were in the preparation of information to be extended.

Since delivery of the GOS program for rural development is through the RDA system and extension is the leading edge of the effort, the CSR/E Project basically supports and backstops the RDA Program. Therefore, certain aspects of it (the RDA Program) are fundamental to project progress and may be helpful in explaining certain conclusions reached by the Evaluation Team. They are:

1. The RDA Program is basically an institution builder. As noted earlier, the Swazi society and economy have been sharply dualistic with what have been called "traditional" and "modern" components. The RDAs are the local units through which the GOS delivers whatever programs it sponsors in rural and agricultural development on SNL. The RDAs' governing and decision-making mechanism bridges the traditional governing establishment and the modern governmental mechanism. Decision making is shared, with the traditional values being protected, while the people are increasingly

immersed in a modern, market-oriented economy. One objective is to shift the Swazi homesteader from subsistence to semi-commercial and commercial agriculture through the development of institutions socially acceptable to the people. The farming systems research/extension concept which the Design Team for the CSR/E Project adapted to fit the need in Swaziland is uniquely able to provide research findings and extension recommendations adapted to such a socioeconomic situation.

The RDA Program is the central thrust of the nation-building effort in Swaziland. The RDAs link the government to the people. A properly implemented CSR/E Project is capable of increasing the credibility of the government in the eyes of the people.

2. The RDA Program involves the area approach to planning and development. The RDA approach takes into account all of the factors which must be considered if development is to be achieved. In establishing an RDA, four factors are considered: (a) Natural resources (RDA boundaries are normally based on watersheds); (b) the economic base; (c) social criteria; and (d) political groupings. By taking into account all of the above, the RDA Program has the potential for avoiding some of the pitfalls inherent in other approaches to planning and development. The farming systems research/extension concept, which develops and delivers recommendations for systems by areas, fits very logically into an area approach.

3. The RDA is a good management unit for the delivery of GOS programs intended to foster national economic and social progress. The RDAs are

decentralized and close to the people. In most other developing countries, there is a tendency for the central government to exert ever-increasing control over local affairs and to resist decentralization. In Swaziland, decentralization is a reality. The people are involved. CSR/E should produce relevant recommendations which an RDA can implement.

4. The various parts of the RDA Program are so interrelated that they can rarely be veiwed as independent variables and evaluated apart from the total program. The CSR/E Project is a good example. Its ultimate success depends upon the success of the RDA Program. The goal of the project as stated in the PP is "to increase the economic viability of farming on SNL," and verifiable indicators are: (a) to increase the percentage of SNL farms producing primarily for the market (author's underscore) to 20 percent by 1992 and 30 percent by 1997 and (b) to increase the percentage of SNL farms producing a marketable surplus above subsistence needs to 60 percent in 1992 and 80 percent in 1997 (PP, Annex I, p. I-1). Research, extension training, and agricultural information, the major ingredients in the CSR/E Project, cannot in and of themselves produce the required verifiable indicators. However, the RDA Program can produce the indicators; therefore, the project is a symbiotic part of the RDA effort.

While the RDA Program is dynamic and has changed over time, an understanding of its content at the inception of the CSR/E Project is a desirable prerequisite to a good evaluation of the project. The RDA Program, circa 1979, was approximately as follows:

1. RDA centers either had been or were being developed for administrative offices, staff housing (including extension), mechanization pool workshops, and cooperative marketing. The center is the hub of the RDA. From it, administrative, marketing, and extension services radiate. All parts of the RDA are reasonably accessible from the center.

2. Reallocation of land, land use planning, and resettlement of people are key ingredients in the RDAs.

a. Suitable blocks of arable land are separated from grazing land. The arable land is protected against erosion by appropriate structures (terraces, grass strips, grassed waterways, etc.) and by agricultural management practices (strip cropping, crop rotation, etc.).

b. Grazing land is fenced from arable land. Appropriate range management practices are sought (unfortunately, often without success) to minimize grassland degradation and increase economic returns from livestock.

3. Roads are planned and locations established for schools, clinics, churches, and other central services. The roads facilitate the involvement of the homestead families in the market economy. Access roads within RDAs and feeder roads to the national highway system are constructed.

4. Families living distant from roads and services are encouraged to resettle in homesteads in closer proximity along the boundaries between arable and grazing land (see no. 2 above). The intent is to simplify the management of the lands used by each homesteader and to make it easier to provide access to central services and water supplies.

5. Safe domestic water supplies are given attention. A water supply is planned for each project center, and they are expanded by piping water to the vicinity of homesteads. Additional systems are encouraged through both force account construction and participation (contributions) by the homesteaders.

6. Small dams and reservoirs are constructed, springs developed, and other water facility development is undertaken to provide water for livestock and to provide irrigated vegetable gardens and for fruit production. Small irrigation projects, where applicable, are installed.

7. Extension plays a key role in each RDA. All RDAs have a complement of extension personnel to improve farming, marketing, and domestic science. Increased extension activity and consolidation of fragmented holdings should permit farmers to utilize their land more effectively. It is expected there will be greater use of improved seed, fertilizer, pesticides, and machinery. Emphasis is on the homestead moving from the subsistence to partially commercial, and finally, perhaps, completely into the market economy.

8. Specialty crops and enterprises may be developed where they are economically viable, and most RDAs have at least one such program.

9. Where wood is scarce, communal woodland plantings are encouraged to provide the community with firewood and building poles.

10. Ready availability of supplies and marketing services are recognized as being vital to development. A major supply depot and subsidiary depot are constructed in each RDA. The Central Cooperative Union (CCU) provides for the marketing of crops, supply of inputs, and consumer items.

11. Health care and educational facilities are provided by GOS in each RDA.

B. Project Description

The CSR/E Project is a joint undertaking between GOS and USAID, with additional assistance from the Peace Corps. The Project Agreement (Pro Ag) signed by the appropriate officials from GOS and USAID provides the terms of reference. The project focuses on research and extension, and utilizes the farming systems approach, but is restricted to crops. The MOAC is the implementating agency, with a Title XII contractor, Penn State, providing most of USAID's contribution. From the perspective of USAID, "The purpose of the project is to improve the capacity of the GOS Ministry of Agriculture and Cooperatives to develop and extend cropping systems recommendations relevant to the needs of the SNL small farmer" (PP, p. 1). It is therefore very clear that the project is expected to build and strengthen institutions.

The stated goal of the CSR/E Project is "to increase the economic viability of farming on SNL" (PP, Appendix I, p. I-1). The objectively verifiable indicators, in a sense, "define" the term "economic viability." The CSR/E Project is to emphasize production for the market, or more specifically, contribute to the monetization of the SNL rural society. Emphasis is on

increasing the percentage of homesteads producing primarily for the commercial market, and the percentage producing a marketable surplus (author's underscores).

How is the CSR/E Project to contribute to achieving the goal specified for it in the PP? The answer is found in the PP narrative summary of the purpose statement and in the section entitled "Project Approach" (p. 26). The PP identifies the basic constraints, and proposes a means for alleviating them.

The three constraints viewed as being "basic" to increasing small farmer (homesteader) incomes and to MOAC not achieving its goals in the RDAs are: (1) Lack of relevant research recommendations; (2) the inability of the extension service to effectively motivate homesteaders/farmers to adopt improved farming practices; and (3) the lack of adequate field support for extension workers in the form of extension and teaching aids. The project proposes to strengthen two key GOS institutions--the Research and Planning Department (Directorate) and the Agriculture Department (Directorate)--and through their programs, to alleviate the constraints. Specifically, the research organization is to be strengthened and a program started which initiates recommendations which "provide useful results to extension agents and farmers" (PP, Annex I, p. I-2). A farming systems approach to research is to be utilized because recent experience in selected other developing countries has demonstrated its capability to produce the desired recommendations. Most of the research is to be conducted on farmers' fields, with extension personnel as active partners. The Extension Training Unit in the Department (Directorate) of Agriculture in MOAC is to become

capable of conducting large numbers of on-farm research trials and on-farm demonstrations of research recommendations. Extension workers are to be upgraded through training, and in 5 years, the Extension Training Unit in the Department (Directorate) of Agriculture is to be capable of reaching 75 percent of SNL homesteaders/farmers annually with improved research recommendations. A fully integrated research-extension system within MOAC is envisioned, and it is assumed homesteader incomes will be higher and increasing numbers involved in the market subsector of the economy.

The enhanced capacities in research and extension which are implicit in the CSR/E Project purpose statement are to be produced by outputs resulting from inputs provided by USAID, GOS, and the Peace Corps. As indicated earlier in this report, projected input costs for USAID are about $13 million and for GOS, more than $4 million.

The USAID input contribution to the project is composed of three major components. All inputs contribute to the components. They are:

1. A research "package." During the life of the project, research findings which are relevant to SNL homesteaders are to be produced by the use of systems analysis, and an effective research department created and institutionalized.

2. An extension training "package." Extension workers are to be trained in the use of relevant research findings and in extension methods.

3. An agricultural information "package." The materials needed by extension are to be produced.

Training, including short-term, long-term, and in-service, supports and strengthens all three major thrusts.

More specifically, the research component of the CSR/E Project is to focus on "an analysis of the systems within which small farmers operate" and the development of cropping recommendations. Livestock are not considered. An adaptive, on-farm research program is to be designed, using farming systems methodology, and the entire program conducted with the support and involvement of extension (for a statement of extension's involvement, see Appendix I-Z, item 2, under verifiable indicators). In addition, applied research is to be conducted on research stations. The USAID contractor is to assist the GOS in establishing an appropriate research organization, develop a program based on the systems approach, and train the personnel needed.

Since it is very clear that the GOS expects the extension program to be the key, frontline MOAC developmental effort on the SNL, the project calls for the inputs needed to upgrade the expertise of extension officers. Training in extension methods is to be provided by the contractor, including the use of farm cropping systems research results. Since extension is to be involved in the cropping systems research program from the beginning, a smooth flow of information from researcher to extension to homesteader is envisioned. Extension is responsible for delivering sound recommendations to homesteader/farmers and motivating them.

The Agricultural Information Section in MOAC is to be strengthened so that the materials needed by extension are produced.

A special element in the USAID segment of the CSR/E Project is academic training for some diploma graduates who will staff the Crop Production Section of the MOAC. The services of these personnel are not rendered in the Research and Planning Department or the Extension Unit in the Agriculture Department, but they contribute to the project purpose. They are required if GOS is to be able to continue to improve and upgrade cropping on the SNL.

Construction, commodities, etc., needed to support the major components are included in USAID inputs.

The GOS, for its part of the inputs required, agreed to create the posts needed and cover its personnel salaries and wages. Research facilities are to be provided, as well as housing and vehicle maintenance and some commodities and supplies.

The Peace Corps contribution was planned as four volunteers.

IV. THE PROJECT SETTING: 1984

One of the first steps which must be undertaken in a project evaluation is to determine whether the setting has changed. If it has changed very much, the project may need revisions, or perhaps even to be terminated. The CSR/E was initiated in 1979, and the 1979-84 period has been one of rapid change in Swaziland. Many of the changes are a result of conditions external to the project, but some are internal. The more important changes follow.

A. Swazis want greater control, and are anxious to be completely responsible for the planning, decision making, and general conduct of agricultural research, extension, and other programs as soon as possible.

In the late 1960s and early 1970s, Swaziland was very dependent upon expatriates for the design and implementation of projects and programs. As late as 1974, there were very few Swazis who were university graduates or who had moved into strategic positions. Many of the important decisions were, in effect, made by expatriates.

In 1974, leadership for the RDA Program was provided almost entirely by expatriates (see Evaluation, USAID Infrastructure Project, 1983). Step by step, Swazis have assumed responsibility for their country's destiny. Whereas in 1974 only one RDA manager was a Swazi, today, all of them are.

The research program has gone through similar change. In 1978, almost all of the research was conducted by expatriates. Today, well-trained Swazis

are beginning to return. Discussions in which the Evaluation Team participated indicate GOS personnel are ready to take increasing control of research activities, and in the very near future, they will want, and should have, full control. USAID's contribution, by whatever means, clearly must be supportive. Swaziland is establishing its own identity very rapidly.

Swaziland stands on the crest of a time when even more rapid change can be expected. The implications from the above for USAID are primarily a matter of modus operandi. How contractors implementing USAID's contribution to the CSR/E and other projects interact with host-country institutions and personnel may change significantly in the next few years.

B. The national approach to agricultural development is now clearly defined, and the requisite policies are emerging.

It is interesting that the CSR/E PP made relatively little reference to the RDA Program. The reason given is that there were uncertainties about its role and future. Within the past year, any doubts anyone had about the strategy and approach the GOS intends to utilize in agricultural development should have been put to rest. The merits and problems of the RDA approach have been studied in depth and debated at the highest levels. The strategic decisions have been made. The conclusions from the Symposium on the RDA Program, Phase III, which the Evaluation Team was told represents the positions and policy of GOS, provide many of the guidelines which have been lacking. Swaziland has taken a major step forward.

The message is loud and clear for the CSR/E Project. The project plan in the PP was necessarily vague in terms of how the research organization was to relate to the RDAs and what was ultimately to be the structure of extension in MOAC. In the future, there is a much reduced need for vagueness. The extension approach has been settled. It is to be the Training and Visit (T&V) system approach. Adaptation is needed, but the key decision has been made. Now, the decision needs to be communicated to all levels. Also, decisions appear to have been made on the role of the farming systems approach in the total national research program. Farming systems is to be the keystone in the national research program.

The recent decisions cited above are very important for the CSR/E Project. For example, prior to decisions on how extension was to be organized and how farming systems was to be integrated into the total research program, many of the relationships needed for the farming systems approach to succeed had to be on the basis of personal friendships. Now the project can pass on from the uncertainty of the early years, and the building of relationships between research and extension largely on the basis of personal friendships can be augmented by formal ties and linkages. It is time for the Research and Planning Directorate to communicate the decisions which have been made to all parties and fine tune the organizational structure. It is time for research-extension linkages to be solidified and communicated to all parties at all levels. Priority should be shifted to communicating decisions, and the Evaluation Team is convinced GOS is ready to do what is needed.

C. Financial support for GOS from aid donors has diminished, and the revenue problems currently being faced are likely to continue for many years.

When the CSR/E Project was designed, the GOS was receiving aid from several donors and the international economic recession of the early 1980s was yet to come. It was anticipated external aid would continue at relatively high levels and the inputs to which GOS made a commitment would be well within its means. The RDAs were relatively well funded.

Today, aid from external sources has been cut back, and GOS faces a fairly serious financial problem. GOS employees face severe kilometer-per-month travel restrictions. Funds for transport, construction, and operating budgets are very scarce. Unfortunately, relief is not in sight.

The CSR/E leadership, and the GOS in general, needs to review the project's program and revise it to take into account the inherent constraints which are likely to exist for many years. For example, it is not logical to plan as though research or extension personnel will have unlimited use of four-wheel-drive vehicles. The CSR/E Project needs to be rethought and revised so it can be conducted with the resources likely to be available.

D. Marketing is now recognized as a much greater constraint to progress on the SNL.

USAID and the Design Team for the CSR/E Project recognized that there were marketing problems, but concluded attention should be focused elsewhere at the time (PP, p. 53). This was probably the right decision then, but today

there can be no doubt further progress on the SNL will be very slow unless storage and marketing are improved. Marketing is a serious constraint across the board--livestock, corn, beans, vegetables. The fact that from time to time, there simply are no buyers is a serious disincentive to production. High storage losses are a disincentive. Increased efficiency in production should not be viewed as a substitute for a stable market or an adequate price for the product. Looking to the future, it will be very hard, and perhaps impossible, for the RDAs, hence CSR/E, to achieve their goals if marketing is not improved. The marketing problem does not need to be attacked by CSR/E, but it must be attacked by someone. USAID and GOS are aware of the problem, and the GOS has developed a program through the International Federation for Agricultural Development (IFAD) to begin to tackle it.

E. National level policies and administration are now recognized as being important factors in whether CSR/E is ultimately successful.

When the Design Team for CSR/E prepared the project, it was assumed the policies needed to foster development on the SNL would be forthcoming and that vital administrative decisions would be made rather readily. It is now known establishing the proper policy environment is a difficult process, and technical assistance in policy and administration may be required.

F. In order to take full advantage of what the systems approach has to offer requires consideration of livestock.

Livestock were recognized as an important part of the SNL homesteaders' life when the PP was prepared, but the environment was not right for including them in a full-fledged farming systems research and extension project. Therefore, livestock were not included and it was believed a "limited" farming systems project was best. It is now recognized that livestock cannot be ignored if the system of farming on the SNL is to be fully understood and relevant recommendations based on research prepared. Also, most of the early problems concerning jurisdiction over crops and livestock programs have been solved.

Conclusions: The setting has changed, and an important impact is that the need for a farming systems research/extension program is greater than ever. However, new constraints have been discovered, and the CSR/E Project should expand its horizon to include the homesteaders entire farming operations.

V. THE PROJECT DESIGN IN RETROSPECT

A. Reevaluation of the Logical Framework

AID projects are based on a planning matrix called a logical framework (log frame). At the risk of oversimplification, the log frame calls for viewing a project in terms of inputs, outputs, project purpose, and goal. The idea is that if the inputs are provided, the outputs will be produced. If the outputs are produced, they will cause the project purpose to be accomplished. With the accomplishment of the project purpose, the goal is achieved. For each--inputs, outputs, purpose, and goal--verifiable indicators are specified and quantified. While the order cited above--inputs to outputs to purpose to goal--conveys the idea behind the log frame more readily than the reverse, sound project planning calls for the reverse. The project goal should be externally determined, i.e., it should be a greater societal "goal" or something of high priority to the government or the people. The project contributes to the goal, and it is not selected *ipso facto*.

In project evaluation, it is important to ascertain whether the project purpose *does* contribute to the goal, whether the outputs are *only* those necessary to achieve the purpose, and whether the inputs are those *required* to produce the outputs. The logical framework for the CSR/E Project is Appendix A of this document, and the analysis of project progress which follows in Part VI is keyed to it.

In the process of evaluating a project, it is very helpful, if not absolutely necessary, to reevaluate the log frame very early to determine whether the data provided in it remain a sound basis for measuring progress. First, it must be asked if the review of the project setting has indicated the goal is outdated. Second, whether the verifiable indicators specified in the log frame are (still) adequate measures for each item should be questioned. Finally, it should be determined whether the assumed relationships between each item are (still) valid. This part of the report provides the Evaluation Team's insights into these three questions, but concentrates on goal, purpose to goal relationship, validity of verifiable indicators, and soundness of the assumptions.

The goal, namely to increase the economic viability of farming on SNL (PP, Annex I, p. I-1), remains a valid basis for a project. The GOS continues to give highest priority to increasing the quality of life for the Swazi people residing on the SNL. The GOS reaffirmed in the spring of 1984 that the RDA approach is the keystone to the national effort to assist homesteaders residing on the SNL and that the entire SNL shall be covered. The GOS program calls for increasing production and income from farming on the SNL. The GOS intends to move increasing numbers of homesteaders into the market economy. The goal remains consistent with AID policies and USAID's Country Development Strategy Statement (CDSS). Therefore, the goal as stated in the narrative summary of the PP is excellent; the evaluation team sees no need for revision or change.

The objectively verifiable indicators for the goal were not found to be satisfactory because they are too narrow in scope. Experience and

information obtained in the baseline survey show that achievement of the verifiable indicators will not necessarily indicate success in reaching the goal. For example, a reduction in the real or cash cost of inputs used to produce a given quantity of product could represent increased "economic viability," but it would not necessarily be associated with either indicator. Also, two of the important assumptions have not been met or are questionable. First, the marketing system has not fostered increased production, or commercialization in corn, and the market for vegetables is very thin. Second, GOS policies have not encouraged commercialization, or cash cropping, to the extent the Evaluation Team believes is desirable. (See Part VI for greater detail.)

The shortcomings in the objectively verifiable indicators for the goal and the problems with the assumptions require attention, but they do not jeopardize the project. Three actions are recommended at this time:

1. Add additional objectively verifiable indicators to include a composite of: (a) Total production; (b) homestead net income and real income; (c) the contribution from homestead production to family food supply; and (d) homestead family nutrition.

2. Address the market problems. (They do not necessarily need to be addressed in the project.) GOS, USAID, and other aid donors may elect to deal with them independently, but they must be addressed.

3. Establish policies as soon as possible which provide additional incentive for SNL homesteaders to increase production of basic foods and for the market. (This is a GOS responsibility, but it may wish to ask USAID or another aid donor for technical assistance in agriculture and rural development policy and administration.)

The purpose, if achieved, will contribute to accomplishment of the goal, but the changed setting discussed in Part IV indicates revision in interpretation and updating would be appropriate at this time. The verifiable indicators are satisfactory.

While limiting the CSR/E Project to crops when it was designed was probably wise, experience to date with it and similar projects in other developing countries indicates that such a limitation is no longer desirable. It is now very clear that the SNL homesteader farming <u>system</u> includes consideration for livestock, and if the <u>system</u> is to be understood, they must be included. Livestock are a source of cash income, store of wealth, and prestige element. Cropping cannot be viewed as a "system unto itself." There is a market for livestock, and more than 90 percent of the homesteaders own some. It is quite conceivable that marketing products from the soil <u>through</u> livestock may be the best way to achieve the project's goal.

The Evaluation Team recommends that the constraint on livestock be relieved and that the CSR/E Project begin to utilize an unrestricted farming systems analytical approach. Cropping recommendations should continue to receive top priority. The research program in livestock should be tightly

controlled and restricted to very high priority activities which are absolutely necessary to backstop the farming systems research and extension program. On-farm activities should be the focus for any livestock research, as well as for crops. If funding is very restricted, it would be feasible to limit the development of recommendations to crops and cropping; however, the role of livestock must be considered in decisions on them.

Problems have been encountered in the first assumption, "adequate financial resources will be made available to meet MOAC recurrent expenditures." At the present time, travel is restricted for MOAC personnel and other constraints could be cited. Two recommendations are offered concerning the assumptions: (1) CSR/E Project leaders should review project plans and the program, and, wherever possible, redesign and revise it to minimize travel and recurrent costs in the long run (this point is discussed later in the report); and (2) the GOS should give priority to the project and provide the inputs needed since productivity increases the project is designed to bring about will contribute greatly to improving the tax base and raising the gross national product (GNP).

The second assumption, concerning participant trainees returning and remaining in the posts for which they were trained, is rapidly approaching being a very serious problem. Its reconciliation requires immediate attention. As of December 1, 1984, two of four returned participants were not working actively on the project. One had left government service and another had transferred. A third returned participant was not working with enthusiasm because he was not being paid. This is serious, and it is recommended that corrective action be taken by GOS at once.

In summary, the purpose to goal assumptions are valid, but, based on the first 2.5 years of project experience and from the many other farming systems projects in the world, the need for improvement is indicated at this time.

The output to purpose relationship (validity) is discussed in detail in the log frame analysis. In general, if the outputs are produced, the purpose will be achieved. Good progress is being made.

Conclusions: The project design is good, but based on experience, slight modifications are needed. The modifications are no greater than should be expected mid-term in a pioneering project. The changes are vital, and USAID and GOS are urged to give priority to making them as soon as possible. It is recommended the purpose statement be defined to include livestock and that there be minor additions made in the output and input segments. These additions should be commensurate with the expanded purpose and revised, objectively-verifiable indicators for the above-recommended goal, and corrective action should be taken for several assumptions.

B. Pre-evaluation Changes in the Project Design

There have been no changes in the project design to date. Slight changes in staffing by the contractor have been authorized.

C. Consistency with Current AID Policy

The project is completely consistent with current AID programming policy and philosophy. The BIFAD member of the Evaluation Team indicated the project is an excellent example of the application of Title XII ideology.

D. Current Validity of Socioeconomic Feasibility

The analyses supporting the socioeconomic feasibility conclusions were examined to provide a basis for determining their current validity. The economic analysis indicates the project's Design Team relied heavily on infrastructure and irrigation to yield the anticipated benefits. This is now questionable. The Evaluation Team, as well as GOS and the CSR/E Team, would probably now give greater emphasis to rainfed farming, and, in light of the slowness with which markets are progressing, infrastructure may have less impact than was anticipated. In addition, infrastructure is behind schedule. No internal rate of return was prepared for the project.

An updated economic feasibility analysis could be of considerable benefit to all parties to the CSR/E Project. First, it could guide GOS and USAID in terms of determining how large and/or how complex a research institution is desirable.

Recommendation: The CSR/E team should be asked to do an economic feasibility analysis for the remaining life of project (LOP) The

beneficiaries are identified in the PP, but the mid-project review casts more light on who they are. The section can now be updated, and doing so should improve the project.

Recommendation: The CSR/E Team should revise and update the beneficiary section of the PP. The social soundness analysis was relatively well done, and no revision appears to be needed at this time.

VI. PROJECT PROGRESS AND PROBLEMS

A. Logical Framework Analysis

The log frame is the strategic planning, implementation scheduling, and evaluation device in all projects in which USAID participates. The logic of the device is discussed earlier. The log frame analysis is, in a sense, the most important part of the evaluation. In it, progress toward the objectively verifiable indicators is determined. Recommendations are included wherever they are appropriate.

Part VI is keyed to the project's Logical Framework (PP, Annex I), which is Appendix A of this document. Section B covers the Goal; Section C, the Purpose; Section D, the Outputs; and Section E, the Inputs.

B. Goals

The CSR/E Project goal, as stated in the Logical Framework of the PP, is "to increase the economic viability of farming on SNL" and stated indicators are described as:

1. Percentage of SNL farms producing primarily for commercial market increases to 20 percent by 1992 and 30 percent by 1997.
2. Percentage of SNL farms producing marketable surplus above subsistence needs increases to 60 percent by 1992 and 80 percent by 1997.

The Evaluation Team does not feel that these are valid indicators or that they really could be measured under present Swaziland economic or cultural conditions. Self-sufficiency measurements, or proper land use and conservation indicators, may be much more meaningful and significant indicators of project success. Another set of indicators that might be considered could be the RDA production goals for each area. Recommendations concerning mid-term goal revisions for the project are included in Part V-A.

The purpose to goal assumptions, as stated in the Logical Framework, are:

1. GOS policies will continue to encourage cash cropping.
2. Production inputs continue to be available on a timely basis.
3. Marketing systems can accommodate increases in commercial farm activities.
4. SNL area under irrigation continues to increase.

Certainly, the goal assumptions of the PP, the team feels, must be reevaluated at this point in time. It does not appear that the numbers of commercial farms anticipated could be reached in the time frames spelled out in the original Logical Framework and it is of limited utility as a measure. It also appears that the available marketing systems will need much more detailed study and improvement before the project pushes for more increases of commercial volumes in irrigated horticulture or corn. Marketing constraints have arisen that were not contemplated during project design. Recommendations are included in Part V-A.

In tracking the project goal further, the purpose assumptions upon which the project was designed and on which stated outputs were based are:

1. Adequate financial resources will be made available to meet MOAC recurrent expenditures.
2. Participants will return and remain in staff positions for which they were trained

An in-depth study needs to be made of the financial resources available to MOAC for recurrent expenditures of this project. It appears that in the long run, it is not logical to assume MOAC will have the resource allocations necessary for some of the project's operational expenses. Maintenance of vehicles, fuel, and staff salary costs are in question. Some of the returning participants (50 percent) have effectively dropped out of the project. GOS, perhaps with USAID's assistance, must take action if the institutionalization objective is to be achieved. GOS may wish to require some type of a completion of service bond arrangement for participants in order to assure the project that the trainees will be available to work as CSR/E Project staff upon their return from training. Recommendations are included in Part V-A, and a special section provides greater detail later in the report.

Stated input to output assumptions which are closely related to purpose achievement are:

1. The GOS will establish required posts.
2. Qualified Swazis will be available for training.
3. Posts essential to the project will be filled by qualified Swazis.

Only no. 2, has been met, and GOS is commended for it. Not all posts needed have been established nor have as many candidates as is desirable been

nominated or allowed to go for off-shore training. Also, the research posts which exist at present are not attuned to the utilization of farming systems as the heartwood of the Swazi national research effort. The current job descriptions for posts appear to be those which would be expected in a research organization relying very heavily on station research. (Job descriptions are "standard brand" commodity and discipline oriented.) Little is said in job descriptions about the necessity for multi-disciplinary work, or the need to work closely with extension. This situation needs immediate attention.

The posts needed by the RAs have not been created, and the Evaluation Team learned they were an unhappy group, with little esprit de corps and low morale.

Recommendations, all directed toward the Department of Research and Planning, MOAC, are:

1. The role of RAs in the national research program of the future should be studied and defined, and attention should be given to establishing a personnel ladder for them as soon as possible.

2. GOS should establish and describe research positions consistent with the needs of the farming systems approach to research/extension.

3. GOS should make revisions in the personnel system or take other action which would retain the pesonnel trained for research positions, and provide an employment environment in which they can be productive researchers.

C. Purpose

The Project Purpose, as stated in the PP, is "to improve and expand the capacity of the MOAC research and extension program to develop and effectively extend cropping systems recommendations relevant to the economic needs of the SNL farmer."

As measured by the inputs and outputs as detailed in the Logical Framework, project achievement was found to be close to target indicators at this mid-term point in the LOP. GOS, USAID, and the USAID contractor, Penn State, are commended for what has been achieved.

The project design contains the essential elements and resources needed to achieve the stated project purpose. What is not clear at this point is if the project staff, the MOAC administrators, the contractor, and/or USAID have an adequate and current strategy for the next few years. Within the CSR portion, the multidisciplinary approach seems to be breaking down, or is being used only partially. Neither is it very clear what the agricultural information or extension training portions of the contract are doing in a planned and organized manner to achieve the purpose of the project. This is viewed as a minor problem, but attention to it would be desirable.

Looking to the future, the measure of whether a sustained effort can be continued by the MOAC to extend valid cropping and/or farming systems recommendations to the SNL farmers will be, in part (1) the quality of their technicians assigned to an FSR/E program, and (2) the extent to which this methodology can be institutionalized into the national agricultural sector

program. The Contractor Team feels the Swazi researchers assigned to the project as counterparts and others and as off-shore trainees have been excellent in quality. The problems lie in the personnel system in the Department of Research and Planning, which as indicated above, needs attention.

Progress has been made in terms of creating a bona fide Swazi research and extension program capable of carrying forward a farming system based program without expatriate assistance, but at this date, the Swazi staff assigned to the project and at work in the field sites could not complete the verifiable indicators as stated in the PP without the help and guidance of the USAID contractor staff. It is anticipated that when all the FSR/E posts are filled and the long-term trainees return, they will be able to perform at the levels indicated in the PP.

A problem the Evaluation Team encountered concerns attitudes of Swazi personnel other than administrators toward the CSR/E Project. Swazi personnel interviewed by the Evaluation Team are not generally aware that GOS plans to make the FSR/E approach the keystone in its research and extension program. Several Swazi personnel said they viewed the current CSR/E effort as a "3 to 5-year project" which will come to a definite end. They foresee big changes in their roles and activities when the project ends. It is thus clear much work still needs to be done by the MOAC administration to sell the FSR/E approach to its technicians and to structure research employment opportunities in a manner which will encourage good scientists to stay with the organization and be productive.

Full utilization is not being made of the extension service as an active FSR/E element and as the major channel to communicate research findings to the SNL farmers. Plans to include extension as a full and equal partner must be prepared as soon as possible and the draft design should come from the CSR/E Project staff, in cooperation with appropriate personnel in MOAC administration. The final decision must be made by MOAC.

At present, CSR/E is almost entirely a research phenomonon, and to a great extent, it is the product of expatriate, project-assigned technicians. It is not yet identified as an "MOAC activity," and certainly not as a research/extension FSR/E effort, as measured by the following indicators of what the extension program should be capable of:

1. Conducting 100 on-farm research trials and 160 on-farm demonstrations of research recommendations yearly.
2. Conducting annual field days and farmer training sessions.
3. Reaching 75 percent of the SNL farmers yearly with research recommendations.
4. Conducting in-service training sessions reaching 50 percent of the total number of extension workers annually.
5. Putting research recommendations into a form usable by extension workers and applicable to SNL farmers with various resource constraints.
6. Conducting an effective information program to supplement direct extension agent efforts.

The Evaluation Team does feel that when the GOS has made the necessary structural changes in research staffing patterns, as well as integrating

extension agents into the field FSR/E activities, the Extension Training Unit and the Research and Planning Department will be capable of reaching the verifiable indicators stated in the Logical Framework.

The Evaluation Team recommends that several objectively verifiable indicators be revised to attune them to present conditions. Specifically, the team feels it is much more important if, during the LOP, packages of technology (improved alternatives to the present farming systems) are designed, tested, and verified by the FSR/E Teams for each of the nine RDAs currently being planned by GOS, rather than just using a given number of on-farm trials as indicators of achieving the project purpose. The team believes that it is extremely important for GOS to have activities in all of the major political sub-divisions. The team also suggests that a more meaningful indicator of extension participation would be the number of days per month extension personnel are assigned full-time to the FSR/E activities at the RDA level.

D. Outputs

The PP identifies 15 project outputs in the Logical Framework by which measurements of program progress are to be made. To a large extent, at this point in mid-term evaluation, the assumptions upon which the outputs were designed remain valid, but there are some problems which, if not corrected soon, will become very serious. A majority of the verifiable indicators, as mentioned in the preceding section, still appear to be proper validation points for purpose attainment.

A summary of the expected outputs follows, with comments concerning level of achievement. The Evaluation Team has endeavored to include the present status of each output set, as well as comments and recommendations on future actions or decisions required of project management. The team is unanimous in the belief that adequate project progress has been made thus far. The constraints noted will need treatment during the remainder of the project if all outputs are to be reached and the institutionalization of the CSR/E as the national research and development mode in Swaziland is to become a fact. Appendix B presents details of outputs and accomplishments in tabular form.

Outputs as described in the logical framework are as follows:

1. On-farm survey (one baseline survey and annual updates) conducted on SNL covering:

   - Socioeconomic aspects of current cropping systems
   - Technical practices currently used
   - Productivity in selected crops
   - SNL resource base

A baseline survey constructed from data obtained from the Swaziland Central Statistical Laboratory was summarized in a 1983 annual report, as well as in other documents produced by the project.

Informal surveys by the CSR/E Team were conducted on three RDAs in 1982. A formal verification survey on 270 homesteads in these three RDAs

was completed the following year. Assessments of farmer reaction to on-farm trials were also prepared by the project rural sociologist before her departure.

The original baseline survey has not proven to be an effective tool to measure project progress or to delineate specific project clients. Subsequent surveys have lacked some of the socioeconomic data needed to further refine investigation domains and identify client profiles. The CSR/E Team is aware of this and, at present, is in the design phase of its 1984-85 survey work to include these needed indicators. The Evaluation Team was impressed with the collaboration which has and is currently taking place between the agronomic technicians and the socioeconomist in this much needed team effort. The Evaluation Team was unable to ascertain exactly how the expatriate horticulturist and irrigationist were involved in most of the update work. The two technicians have now recognized that there is a data gap, and they are taking action. This may need further attention.

2. Scientifically designed experiments conducted at the Central Research Station.

Eight agronomy experiments were conducted in 1983-84. These were related to the ox planter modifications and problems of its use in manure applications and seed and leaf analysis.

On-station investigative work in horticulture involved some 45 trials, which were reported during the last 2 years and dealt with:

- Introduction of crops
  - Fruit and nut trees
  - Blueberries
  - Strawberries
  - Vegetables
  - Melons
- Variety trials
- Potato fertilizer applications
- Weed control
- Long day onions
- Antitranspirants and mulches
- Seedling production

Five sets of trials were conducted in irrigation. These included furrow/ridge experiments and investigation of evapotranspiration devices.

The Evaluation Team noted that a number of component research activities have taken place at the Central Research Station. The team feels that, in general, a proper balance of on-station research has been maintained in the irrigated crops and the rain fed systems. However, the team wishes to stress that during the next few years, the majority of the research work should take place on farmers' fields at their homesteads. On-station research should generally be supportive of the on-farm work.

3. Scientifically designed experiments conducted at outlying stations.

In horticulture, approximately 12 were conducted; one covered sweet corn, and the others were with fruit and nut trees.

The evaluators ageed that during the remainder of the LOP, more outlying stations may have to be used for some types of component research, as the addition of some six new geographic locations may necessitate these satellite experiments. In some cases, it may be necessary for the project to rent farmers' fields for special trials, such as some of the basic irrigation work still to be completed.

4. On-farm trials.

In agronomy, approximately 100 total trials were established, with data collected from 80 more. Maize trials dealt with varieties, herbicides, modified ox planter, hand-jab planting, and cutworm bait. The dry bean trials were on plant populations.

In horticulture, some 70 experiments have been conducted, and were designed as follows:

- Introduction of crops
  - Fruit and nut trees (cooperatives with one or a few trees of more than one species)
  - Blueberries
  - Strawberries
  - Vegetables
- Full-year cropping plan (eight were started, with a strategy for year-round production; none were completed).

The irrigation section undertook 12 studies, including plant placement, basin irrigation methods, and evapotranspiration trials.

At this point in the project, the quantity of on-farm trials is impressive. The coming cropping seasons will require, perhaps, a two-fold increase in the numbers of on-farm trials to be conducted in the various research domains. This is due to an increase in the RDAs to be served, as well as moving improved and verified systems into the validation/transfer stages of a bona fide FSR/E system where many more homestead replications are required.

5. Annual research reports (five annual reports).

Two annual reports from the CSR/E Team have been produced. An annual GOS research report covering all aspects of research conducted by the MOAC has not been produced for several years. As a result of the project, a GOS report is being typeset at this time. (A draft was made available to the Evaluation Team.)

Both of the completed annual reports cover in detail project accomplishments of the CSR/E Team. What may become a more important issue in the coming years is the distribution of this document. Specific individuals within Swaziland should be key recipients, as well as the institutions working in Eastern and Southern Africa in FSR/E. (The evaluators assume that copies have been provided to the Development Information Utilization Service [DIU] in USAID/W as well as the various USAID regional and bureau offices.) A clearer presentation of where

research stands in the CSR/E master plan and where the next few years will take the project in terms of expected results would help interested readers. It was difficult to gain this view from the material presented in either the annual reports or most of the technicians' papers. In general, progress on annual reports is good.

6. Cropping systems recommendations.

Recommendations are currently (November 1984) being formulated based on the 1982-83 and 1983-84 cropping seasons. These preliminary recommendations have been disseminated through extension training and on-farm demonstrations/research plots. Several publications on the subject results are in press.

In terms of project progress, the Evaluation Team believes output of site-specific, cropping sytems recommendations may be a much more valid measurement than the number of on-farm trials conducted each year. Serious thought should be given to establishing yearly goals in this regard. By the end of project (EOP), the Evaluation Team would expect recommendations, both from the rain fed and irrigated farming systems, to have been developed and validated for each of the nine newly-denominated RDAs.

7. In-service training program designed and courses conducted for extension workers and other MOAC staff.

During 1982-83, 12 workshops were conducted, with a total of 171 (45 percent) of the extension personnel in attendance. The number of

participants for each workshop are indicated below in brackets. The subject areas included:

- Extension Supervisors Workshop (44)
- Horticultural Workshops (39)
- Home Economics Workshop (32)
- Community Development Workshops (28)
- Local Training Days (28)

In 1983-84, seven major workshops or courses were sponsored by the Extension Training Unit:

- Subject Matter Specialists Workshop (30)
- Three-Month Retraining Course of Redeployed Extension Specialists (60)
- Twelve-Month Preservice Training for Certificate Course Students (40)
- Ecology Field Course for Extension Officers and RDA Managers (40)
- Pesticide Safety Workshop for Extension and Research Staff (20)
- Research Methods for Research Assistants and Peace Corps Volunteers (14)
- Up-Dating Extension Workers on the On-Farm Research Project (230)

Approximately 80 percent of extension personnel received training through the project in 1983-84.

The list of training sessions is very impressive considering the assigned tasks that each of the Contractor Team members is required to carry

on in addition to these instructional activities. The RAs mentioned in their presentations to the evaluators that they are in need of additional training. The Chief Research Officer also noted his belief that the Penn State Team should give more attention to some basic investigative instructional activities for the Swazi research officers. The Evaluation Team feels that the Agriculture Information Service (AIS) should give much more effort to the creation of instructional modulars, covering all aspects of the FSR/E methodology, as well as the specific technologies or subject matter skills to be transferred to extension personnel and farmers. The Agricultural Information Officer (AIO) should assist with this project. (A detailed discussion of this section is in Appendix E.)

8. The AIS converts technical recommendations into forms usable by extension agents. The following printed materials are at various stages of production, with the number of copies to be printed indicated in brackets:

- Materials developed in 1984
  - Crop Input Record Book (350)
  - Extension Crop Record Book (350)
  - Order Book for Cropping Systems Project (350)
  - Onion Production Guide (500)
  - Beetroot and Swiss Chard Production Guide (500)
- Editing Completed and Ready to Publish
  - Report of the Agricultural Research Division 81/83 (350)
- Typesetting Completed
  - Tomato Production (500)
  - Cabbage Production (500)
  - Potato Production (500)

- Manuscript on Hand; Requires Author's Approval
  - Carrot Production (500)
- Manuscript Ready for Typesetting
  - Insect and Disease Control Programs
    - Citrus (500)
    - Stone Fruit (500)
    - Apple (500)
    - Avocado (500)
    - Guava and Banana (500)
  - Procedure for Producing Seedlings in Trays (500)
  - Training/Pruning Deciduous Fruit Trees (500)
  - Pruning Grapes (500)
- Slide Scripts Pending Translation to siSwati
  - Pesticide Use and Application on SNL Farms (1)
  - Seedling Production with Seedbeds (1)
  - Irrigation Fact Sheets (original drafts completed and reviewed; final revisions currently being made by authors)
    - Potatoes (500)
    - Tomatoes (500)
    - Carrots (500)
    - Onions (500)
    - Lettuce (500)
  - Field Support Guides
    - Field Equipment for the Pocket/Knapsack (300)
  - Conducting a Method Demonstration (300)
    - Conducting an Individual Visit (300)
    - Conducting a Technical Meeting (300)

- Tips for Good Telephone and Radio Communications (300)

The printed factsheets will be distributed through the MOAC newsletter or via project managers to frontline extension personnel.

The Evaluation Team was impressed with the recent publications and work being performed by the information section. The team feels that much effort needs to be taken to assure that special back-up is given the cropping research activities of the project. Instruction should be given by the AIO to the RAs to help them in report preparation and general writing skills needed at their FSR/E work levels. The list of future publications now prepared by AIO personnel and the CSR/E staff will be an excellent measure of the integration and use of these two divisions to assure that new technology is moved to the proper clients.

A quick review of the 1982-84 titles shows the wide interest of the project personnel in publications and materials development. The integration of this information into a Swazi FSR/E methodology will be of prime importance during the rest of the first phase. The formation of an Educational Materials Committee composed of research and extension personnel should assist in identifying priority FSR/E research, establishing suitable format, and assisting AIO in developing a clearly defined schedule of responsibilities for publication.

9. The AIS develops and implements communications support program to assist extension service. (A detailed discussion of this section is in Appendix F.)

Radio is the major method by which the MOAC information section attempts to reach mass audiences. Some effort has been made to increase the effectiveness of this information channel.

The Evaluation Team feels that additional coordination and cooperation needs to take place between these two project units, the USAID/AIS and the Extension Training Unit, in the preparation of FSR/E instructional modules for use with extension personnel, research staff, and the students in university agriculture classes. (The Florida FSR Project has developed several modules that could assist and guide in this effort.)

The AIS must serve the needs of all MOAC programs since it is a unit of MOAC. However, efforts must be made to insure that the products of the CSR/E get to SNL clients and that the AIS becomes capable of carrying on without expartriates.

10. Materials to support extension field staff produced by the AIS (materials actually in the field and used). (See nos. 8 and 9 above for specific outputs.)

Many of the persons contacted during the evaluation visits think that producing materials to support extension is one of the most important outputs that the project can produce. Few, if any, research findings for SNL homesteader/farmers have been published in the last few years except for those produced by the CSR/E Project. Five extension bulletins on methodology are to be published very soon and distributed to extension workers.

11. Strengthened linkages between Research, Agricultural Information, Extension, and the Faculty of Agriculture.

A series of seminars were initiated by the CSR/E Team for the purpose of bringing together representatives of all the identified groups. Six seminars were held in 1982-83 and 12 in 1983-84.

The project has yet to make the formal linkages needed, and the Evaluation Team recommends that a well-planned strategy be developed for this effort. USAID must play a major role in this process if FSR/E is to include the active participation of the Extension Training Unit. The same can be said for pre-service FSR/E training at the Faculty of Agriculture. The team suggests that the CSR/E Project join with the International Center for Maize and Wheat Improvement (CIMMYT) and start a series of FSR/E short courses in Swaziland. Perhaps a special meeting for key ministry leaders and several sessions for the field technicians and research scientists assigned to the project, along with selected university staff members, could be arranged for 1985. The team also suggests an FSR/E seminar be arranged for middle-level management, i.e., RDA project managers, senior extension officers, and extension supervisory officers. The latter may need to be the first undertaken.

The project, i.e., the Penn State/MOAC Team, has worked closely with CIMMYT in establishing a process for on-farm research activities based upon Swaziland needs, but few other linkages/relationships are apparent.

The project has also obtained genetic materials via several International Agricultural Research Centers (IARCs) and other regional research centers. Visits of the team members have included the International Institute of Tropical Agricultrue (IITA), the International Laboratory for Research on Animal Diseases (ILRAD), and CIMMYT FSR networking meetings and courses.

The Evaluation Team feels that considerable effort must be made during the remainder of the LOP to establish closer working relationships with the international centers and researchers nearby. The efforts to date with the regional CIMMYT FSR Project have been very positive. Similar arrangements should be made for assistance in short-term crop production training of Swazi personnel and to obtain special technical assistance offered by IARCs and other regional institutions. Technical seminars and workshops given in Africa should also be given high priority for both the Penn State staff and the MOAC personnel working in FSR/E. The Contractor Team should initially take the leadership in this effort, but Swazis should be involved from the beginning.

13. Farm demonstrations and field days.

Two field days were held in 1982-83 and four in 1983-84.

There is concern by some members of the Evaluation Team that the Penn State Team views farm demonstrations in the same light as on-farm trials. When the methodology reaches the validation/transfer stage, the Evaluation

Team feels that these could then be counted as demonstrations. This is, however, several cropping seasons away.

The Evaluation Team is sympathetic to the problems of sponsoring field days in Swaziland. This activity should be a MOAC program and if it wishes to conduct farmer training and field days, then the CSR/E Project should participate. The team does not feel that the numbers presented in the PP as verifiable indicators are meaningful at this time.

14. Personnel trained and in place.

At this mid-term evaluation, most of the candidates for long-term training have been selected and are in the United States. Several participants have completed their training and have returned to Swaziland. This technical area of the project has gone largely as planned; however, as has been discussed elsewhere, several of those trained are not working in the positions for which they were trained. The short-term specialized courses for MOAC technicians are behind schedule. The Evaluation Team feels short-term training must receive higher priority in the coming years. Specific numbers and specialties of the trainees are given in other sections of this document. Note Table 1, for more detailed information.

The Penn State Team and Swazi research and extension personnel should develop a complete training plan for short-term trainees. Many of the skills needed for the implementation and institutionalization of FSR/E activities can be obtained from short-term training exercises.

Table 1. Summary of Participants in Long- and Short-Term Training

Long-Term	Discipline	Training Period Beginning	Training Period Ending	Scheduled Completion	Target Degree	Institution
Douglas Gama	Horticulture	08/83		08/85	M.S.	PSU
Donald Hlope	Ag & Ext Educ	08/84		12/86	M.S.	PSU
Zodwa Mamba	Agronomy/Dryland	08/84		12/86	M.S.	TSU
Basil Maphalala	Ag Economics	08/84		12/86	M.S.	PSU
Themba Masuku	Ag Engineering	12/82	01/84		M.S.	UM
Sebenzile Matsebula	Ag Educ/Biometrics	08/82	06/84		M.S.	PSU
Elliot Mavimbela	Crop Science	06/83	08/84		M.Ag.	NCSU
Themba Mavuso	Horticulture	01/83		12/84	B.S.	TSU
Paul Mkhatshwa	Agronomy	09/82		12/84	M.S.	UG
Petros Mtshali	Entomology	08/82	08/83		M.S.	PSU
Magalela Ngwenya	Agronomy	08/83		05/85	M.S.	PSU
Edgar Nxumalo	Soil Chemistry	08/83		08/87	B.S.	TSU
Samson Nxumalo	Ag Mechanization	08/83		08/87	B.S.	PSU
Arthur Simelane	Agronomy	01/83		05/85	B.S.	TSU
Funekile Simelane	Rural Sociology	08/82	05/84		M.S.	PSU
Short-Term						
Jameson Dlamini	Ag Ext Management	06/84	08/84			UM (9 wk.) PSU (1 wk.)
Setsembile Kunene	Plant Pathology	06/83	09/83			PSU

The record of returned long-term trainees has not been as positive as we would wish. Two are no longer with the project. (This is discussed in the next part, Inputs.)

As indicated earlier in this report, the MOAC must take the necessary steps to assure that the candidates will return to their posts, and that these posts will be fully financed upon their return. If participants who complete training do not rejoin the project, it will suffer delay in institutionalization. This topic was discussed in greater detail in Section V.

15. Facilities in place.

Construction is covered in part E, Inputs. However, it is also an output. The building program has not kept up with the design schedule or to a lesser extent, the needs of the project. This has been a constraint to the areas that could be served by the CSR/E activities during the first part of the project. Only 4 of the 14 houses have been completed and approved. The new AIS addition is not completed. (See part E for details.)

USAID should see to it that the homes for the field staff are completed as soon as possible. This has curtailed the field CSR/E activities to a limited number of field sites.

E. Inputs

1. Inputs: USAID

a. Technical Assistance (TA)

Long-Term Personnel: The PP calls for 40.75 person years of long-term TA to be provided by USAID. The contract USAID signed with Penn State as the prime contractor covers the period April 1982-March 1987. To date (October 31, 1984), 19.45 person years of TA have been provided (Table 2). This includes field personnel plus the project manager, who is based on the Penn State campus, and the Tennessee State subcontract coordinator. Interestingly, the contract with Penn State differs slightly from the PP in that the contract calls for approximately 48 person years of long-term support.

The contractor has, in general, provided personnel who fit the descriptions outlined in the PP. The entire team was fielded over a period of 5 months, with the last member arriving in Swaziland in September 1982. All long-term technical assistance personnel were on 2-year contracts. The terms of the C-O-P and of the irrigation specialist were extended for 1 additional year, while the agronomist was extended for 2 years.

With the concurrence of USAID, the agricultural economist and rural sociologist positions were combined when the contract of each expired. The contractor and USAID/Swaziland felt that the issues with which both individuals were dealing could be handled more efficiently if one person

Table 2. Summary of Long-Term Personnel

Title	Name	Length of Service (Months)	Currently on Project
Field Office: Technical			
Chief-of-Party	Thomas B. King	31	Yes
Agricultural Economist[a]	Roland P. Freund	25	No
Agricultural Information Specialist	Glenn D. Bengston	22	No
	Kevin G. Hayes	5	Yes
Agronomist	Christopher E. Seubert	26	Yes
Extension Training Specialist	Glen W. Easter	24	No
	Benjamin H. Weddle	3	Yes
Horticulturist	Doyle W. Grenoble	26	No
	Robert E. Bevacqua	--[b]	
Irrigation Specialist	Gale H. Dunn	26	Yes
Rural Sociologist[a]	Vernaline Watson	24	No
Socioeconomist[a]	John J. Curry, Jr.	3	Yes
Tropical Horticulturist[c]			
		212	
		(17.75 Person Years)	
Field Office: Administrative			
Administrative Assistant	Enid Pali	28	Yes
Administrative Officer[d]	Duma Msibi	8	Yes
		36	
		(3 Person Years)	

[a]Position of Agricultural Economist and Rural Sociologist were combined to form the Socioeconomist position.

[b]Scheduled to begin in December 1984.

[c]Position established to fill the vacancy created by combining the Agricultural Economist and Rural Sociologist positions; Amendment/Modification No. 4.

[d]Position added; Amendment/Modification No. 3.

Table 2. Summary of Long-Term Personnel (cont.)

Title	Name	Length of Service (Months)	Currently on Project
Home Office: Technical			
Project Manager[e]	J. Dean Jansma	26	No
	John E. Ayers	5	Yes
		31	
		(1.3 Person Years)	
Home Office: Administrative			
Secretary[e]	Judy McCormick	5	No
	Lynn Rubin	22	No
	Patricia R. Wilson	8	Yes
	Sandra L. Hayward	4	Yes
		39	
		(1.6 Person Years)	
Home Office: Subcontract			
Subcontract Coordinator[f]	Roland Norman	31	Yes
		31	
		(.4 Person Years)	

[e] 50% of salary charged to project; therefore, total person years charged to the project is one-half the number of months divided by 12.

[f] 24% of salary charged to project.

held the position. Thus, the position of socioeconomist was created and was filled in August 1984. The agricultural economist position and the rural sociologist position were vacant for 2 and 3 months respectively. The combining of these two positions provided a vacancy of one position. A tropical horticulturist position was created to fill the vacancy, which to date, has not been filled, nor does the Evaluation Team feel it should be. The Evaluation Team sees much more need for additional TA allocated to the rain fed agronomic work, and possibly mechanics.

The agricultural information specialist position was vacant for 1 month between specialists. The original horticulturist left the project in early September 1984, and his replacement was due to arrive in Swaziland in December 1984. Current plans are for the original horticulturist to return to Swaziland in late December 1984 for a 2-to-3-week period to orientate the new individual. The original project manager (PM) was named director of the Office of International Agricultural Programs at Penn State and a new PM was appointed in June 1984. Table 2 shows long-term personnel assigned to the project by the contractor.

Short-Term Personnel: To date, 14.75 person months of short-term consultancies have been used by the project (Table 3). The PP calls for 90 person months of consultancies during the life of the contract. Although the number of person months in this area is below expectations, a number of very effective consultants have participated in the project. Requests have been approved for two additional consultants to be in Swaziland during January and February 1985. Table 3 shows short-term personnel assigned to date.

Table 3. Summary of Short-Term Personnel

Name	Speciality	Length of Service (Months)
Robert C. Bealer	Rural Sociology	1.0
McDawson Burton	Research Farm Management	1.0
Donald R. Daum	Mechanization	3.25[a]
Evelyn P. Fancher	Library	1.0
Richard H. Fox	Soil Testing, Agronomy	1.5
William Grisley	Agricultural Economics	1.0
Clive Harston	Agricultural Policy Economics	.75
Winard K. Hock	Pesticide Application Specialist	.5
C. Terry Morrow	Computer Specialist	1.5[a]
C. Marshall Ritter	Fruit Specialist	1.25
Wayne A. Schutzer	Agricultural Economics	1.0
Funekile Simelane	Rural Sociology	1.0[b]
		14.75

[a]Two consulting periods.

[b]Ms. Simelane was enrolled at Penn State as a graduate student in sociology, and was returned to Swaziland for 1 month to assist with the Baseline Survey.

Expenditures: The PP states that, during the life of the contract, $8.14 million will be spent on TA while the contract states that $5,779,740 will be provided for TA (exclusive of indirect cost charges). As of September 30, 1984, approximately $1,383,603 (24 percent) had been spent. It should be noted that these figures do not reflect all that had been spent on the contract. For example, approximately E73,776 (about $41,713) of receipts from the field office had not been cleared through the home office. Some of these expenses were for TA. In addition, the contractor has not been billed for the Tennessee State subcontract coordinator's time (24 percent of his salary). It would appear that the contractor is slightly behind schedule in the level of spending which could be expected at this stage in the contract; however, the rate of exchange of the dollar has changed dramatically since the time of the project design and contract negotiation period. (In 1981, E1 = $1.30 and in 1984, E1 = $0.60.) This difference, plus the delay in getting expenses cleared through the financial system, suggests that the contractor's spending rate may be closer to the expected rate than would appear by looking at the total expenditures to date. At the present time, it does not appear additional funding will be needed unless the contractor's responsibilities and the project program are altered.

The creation of a policy advisor's position to work with the Minister of Agriculture and Cooperatives was not anticipated in the original PP. The Evaluation Team suggests that this added cost should not have a negative impact on needed FSR/E TA at a later date in the LOP.

The Evaluation Team recommends that the training and background of personnel to be provided by the contractor be reviewed and revised. It should be ascertained what can best be provided through short-term consultancies versus long-term assignments. The revised plan should take into account the recommendation that livestock be included on a limited basis.

b. Training

The PP states that 54 study years of academic training and 4.75 years of short-term and work-study type training will be provided at a cost of $1,781,000. Some of the individuals selected for training were to be appointed by GOS to research posts in the MOAC. These individuals were to work with their colleagues on the TA Team for 1 year prior to departing for overseas training. Most were to get master's degrees. The original candidates were to come from the Extension Program's Crop Production Unit, MOAC. In addition, the project was to provide training for individuals to fill those vacated positions. Counterparts of the agricultural information and extension training functions were to be trained also. In total, 20 individuals were to receive overseas academic training. To date, 15 individuals either have been trained and returned to Swaziland or currently are in training (Table 1). Since one of these individuals dropped out, there are six individuals remaining to begin academic training. Some of these individuals have been identified, others have not. The project appears to be slightly behind schedule, but no corrective action is recommended at this time.

Individuals returning with academic degrees are supposed to be assigned in the MOAC as described above. The PP calls for them to work with the contractor's TA Team and to be able to continue cropping systems research and extension training after the team of expatriates departs.

To date, four individuals have returned with the M.S. degree. One, trained in statistics, is working at the Malkerns Research Station (MRS) in a position appropriate for the training and doing a very good job. One has left the MOAC for a job in the private sector. Another asked to be transferred from the MRS where her counterpart was located, and she is no longer on the CSR/E Project. A third has been in Swaziland since August 1984 and has been working, but has yet to receive a paycheck. The reason for the latter not having received a paycheck is because administrators are attempting to place the employee in a higher grade, and this is clearly in both the project's and employee's best interests. Unfortunately, the employee has faced personal hardship and morale is not good.

The above issues are discussed as inputs to strongly emphasize an area that is a major concern to the contractor and the Evaluation Team. Training of CSR/E technicians only to have them leave before making a contribution to the project is not an efficient use of project funds, as discussed earlier in this report. The Evaluation Team feels the GOS must take action which will cause participant trainees to remain with their units upon return to Swaziland.

There is provision for 4.75 study years of short-term training in the PP. To date, only .4 years have been utilized. The contractor is behind schedule in this important area. However, the contract states that the GOS must identify individuals to receive short-term training and must pay the cost of round-trip transportation. This could be a serious constraint to short-term training. The Evaluation Team recommends that the contractor training officer, in cooperation with appropriate representatives from MOAC, develop a detailed plan for short-term training as soon as possible. IACRs and regional institutions should be considered.

The PP states that the contractor will send academic training participants to international institutes such as the International Rice Research Institute (IRRI), CIMMYT, and IITA for training in farming systems research. To date, none of the participants have attended these centers. However, as noted earlier, several individuals have participated in CIMMYT farming systems research workshops in Swaziland and Zimbabwe.

Expenditures: To date, 20 study years of academic training and .4 study years of short-term training have been completed at a cost of approximately $273,290 or 21 percent of the contracted amount of $1,286,759 for participant training. The majority of the long-term students are in training at the present time, so the percent of contracted dollars should increase rapidly in the next few months.

Participant training is not covered as a special input, but it is involved in several different ways. Appendix C provides details on

participant training to date. See Table 3 for a list of participant trainees.

c. Construction

Construction is handled directly by USAID and GOS.

The PP called for the construction of a building to serve as a library/conference room at the Malkerns Research Station. Shortly after the PP was completed, an addition was added to the existing library. This addition meets the need, and a decision was made not to build an additional library/conference room.

An addition to the Soil Testing Laboratory was built at a cost of $14,000. This addition meets the conditions of the PP.

The Agricultural Information Service building has been redesigned as an addition to the present MOAC headquarters in Mbabane and is presently being constructed. The estimated cost of the addition is $255,166 compared to the $192,000 budgeted in the PP. Observation suggests that the completion date of December 1984 would not be met; some time in the first or second quarter of 1985 would be a more realistic date.

Fourteen houses for the field research staff, PCVs, and RAs were scheduled to be built. Four of these have been completed and 10 are under construction, with an estimated total cost of $240,230, which is below the budgeted amount of $260,000 in the PP. One field research storage shed was built with GOS funds.

The Evaluation Team urges USAID to complete the construction as soon as possible. This constraint has not impacted heavily on project progress to date, but it will begin to do so very soon.

d. Equipment and Commodities

Equipment and commodities have been purchased in accordance with the PP and contract. Notable exceptions are the atomic absorption spectrophotometer and the flame analyzer which were not purchased. At the time of project design, it was believed that the instruments in place in the Soils Testing Laboratory could not be repaired. However, they have been repaired and are working properly.

The PP suggested that a mini-computer be purchased and a consultant, early in the project, suggested that a microcomputer would be more practical. Three Apple IIe computers were obtained and there are plans to purchase another microcomputer and to increase the storage capacity of one or two of the remaining computers. These computers, plus the estimated price of upgrading the current systems and the purchase of a new computer, will cost less than the amount budgeted in the PP. The Evaluation Team stresses the need for an adequate data base and information system development. Serious consideration should be given to purchasing a system that will run a CRISS-like software program to provide extrapolation possibilities as new geographic areas are added to the project.

Only two of the ten two-wheel tractors in the PP have been purchased. Their practicality requires further study.

Very little money has been spent on library materials, primarily because the Contractor Team felt that, since the GOS had not appointed a librarian to the Malkerns Research Station, the materials would not be properly handled. At this time, prices are being sought on several books and journals.

e. Vehicles

The contract called for the purchase of 2 station wagons, 5 two-wheel drive trucks, 1 four-wheel drive truck, 4 panel vans, and 14 motorcycles. During the initial phases of the contract, the Implementation Team concluded that station wagons were not necessary and that six pickup trucks were not enough. Consequently, eight additional trucks were purchased. Four vans and 14 motorcycles have been purchased. All vehicles have been purchased in Swaziland.

The Evaluation Team recommends that there should be a review of vehicular needs. With respect to long-range planning, it has been suggested elsewhere in this report that the mobility planned in the beginning of the project may be unrealistic. If the project does a good job in terms of institutionalization, research and extension activities may have to be performed with less travel.

f. Research Baseline Survey

The baseline survey has been conducted and most of the data analyzed. The survey is discussed in detail elsewhere in this report.

g. Administrative Assistance

Three person years of administrative assistance have been provided for the field office and 1.6 person years of secretarial assistance have been provided for the home office (Table 2).

h. Evaluation

Internal reviews were conducted by the contractor, and an external evaluation of the project took place during November 19 to December 7, 1984. (See Section II for a discussion of the external evaluation.)

i. Contingency.

To date, no contingency funds have been used. The Evaluation Team feels that the policy advisor costs should come from contingency line item and not from technical assistance.

2. Inputs: Government of Swaziland

The GOS has made a very reasonable effort to provide the inputs called for in the PP. They are listed below, with comments:

Inputs	Comments
Salaries	Personnel have been provided, but creation of posts has lagged behind schedule.
Vehicle Maintenance, Operation, etc.	Situation currently very tight and slightly constraining on project progress.
Research Facilities and Offices	Satisfactory

Housing and Furnishings	Not a serious constraint, but behind schedule.
Travel Costs for Participants	Excellent. No problems. Travel for short-term participants may be a problem.
Commodities and Supplies	Tight, but not a large constraint.
Contingency	Not required to date.

3. Inputs: U.S. Peace Corps

The PP proposed that the U.S. Peace Corps provide four volunteers for 2-year terms each. Four PCVs were requested by GOS and assigned to the project. Three of the PCVs had master's degrees in agronomy and horticulture. The fourth had a general agricultural degree. A fifth PCV was requested for the Agricultural Information Service. A PCV with a major in journalism was recruited and is currently working with the AIS staff.

The objectively verifiable indicator of PCV support has been met. One of the PCVs working in the Central RDA will soon be leaving and will be replaced by a PCV working in horticulture research at Malkerns. Four houses have been built and inspected for PCVs, and motorcycles have been obtained for those working in RDAs.

The employment of PCVs in a CSR/E coordinating role is viewed as temporary, but necessary to the implementation of the project.

The Evaluation Team recommends that the GOS establish the required posts to take over the current responsibilities of Peace Corps personnel within the next 12-18 months; however, there will be a continuing need for PCVs.

It is anticipated that the GOS will establish posts and trained Swazis will be available to fill them by the end of project. Ten RAs are now working with the on-farm trials and they could be viewed as potential candidates to carry on the work of the PCVs.

F. A Title XII Perspective

1. Consistency with Objectives and Quality of Performance

These issues are dealt with in considerable specificity and detail in other sections of the report, in the log frame analyses, and where cropping systems research, extension training, and agricultural information, the three components of the project, are analyzed.

Review of project reports, consultation with MOAC, USAID, and project personnel, and Evaluation Team observations indicate the project is being carried out in a manner consistent with the stated objectives of Title XII. Quality of performance, as compared to other developing country projects, is good.

2. Technical, Administrative, and Managerial Aspects

Technical: Well trained scientists, with above minimum experience, have been provided by the Title XII contracting institutions. Swazi counterparts chosen by MOAC are capable and motivated. It appears the latter will achieve academic degrees and assume roles as scientific and functional leaders largely as planned.

Administrative: Support by MOAC administrators, within available resources, has been good. Acquaintance with, involvement in and enthusiasm for the project, as an integral part of the GOS movement to make farming on the SNL more productive and economically attractive, is evident among top MOAC officers. Problems associated with MOAC budgets and policies, which are not unusual in developing countries, are mentioned in individual sections of this report.

Support by contract and subcontract administrators is good. Expatriate (contractor) team members have positive feelings regarding home campus support and communication. Regular visits by the project manager and his personal acquaintance with and interest in team members--both expatriate and Swazi--and what they do, and with key officers of MOAC are constructive to the project and have proven very beneficial.

Managerial: Management of the project is aided by the sincerity of and dedication to the project's objectives by the contractor's C-O-P and Project Manager (on campus), the USAID ADO, and MOAC officers. Empathy of the contractor's C-O-P for both the professional and personal needs of team members is evident.

Three areas of strengthening, within resources available, are suggested:

a. Discussion and agreement on roles, between the C-O-P and the USAID ADO, for negotiating with MOAC officers regarding project components--such as construction of facilities, creation of RA positions, or

identification of counterparts--where budget limitations, existing policies, or other considerations may make achievement difficult. It is recognized that, although all aspects are covered in the contract or AID regulations, from time-to-time there are circumstances where responsibility should be carried by the C-O-P or other USAID personnel. Periodic review and early resolution of problems will prevent even a modest interrelationship problem from worsening.

b. A progressive and recorded plan for assumption by Swazis of scientific, functional, and managerial leadership duties and tasks now performed by the Contractor Team in the field. In the agricultural information area, it appears there has been good planning for full assumption by Swazis and that it will occur. In the research program and scientific subject matter areas, one might establish a target date for the Swazi counterpart to become assistant leader, associate leader, then leader. At the latter date, the contractor counterpart would move from scientific leader to associate leader for that subject matter. Should a second Swazi be assigned to that subject area, he/she should become an associate leader at the earliest date where training and experience permit. Similarly it is suggested that the MOAC director of research actively assume at an early date the position of leader of the "cropping systems research effort," including the chairing of scientist staff meetings and the provision of intellectual and philosophical leadership for all personnel. (This might need to be preceded by a period of time as co-leader or associate leader). Such a recorded plan would help assure achievement and would be consistent with and serve the Title XII and agreed-upon concept and goal of institution building. It would also lead to higher levels of

satisfaction for both Swazi and expatriate counterparts. Theoretically, and to the extent possible, expatriate counterparts should not be missed when the project ends.

c. Office and other arrangements for the C-O-P should be made that will enhance communications by senior MOAC officers with the C-O-P, by contractor personnel located at the MOAC with the C-O-P, and between contractor personnel located at the MOAC and at Malkerns. Completion of the addition to the MOAC building might permit, for example, regularly-scheduled, part-time office hours for the contractor C-O-P.

3. Ways Title XII Community Can Improve Support of AID Programs

From a review of this and other projects, it is suggested university and consortium effectiveness in meeting objectives of AID programs can be enhanced by:

a. Establishing and making visible university mission and goal statements, as well as policies, procedures, and incentives that encourage participation in projects by high-quality faculty for extended time periods. This may include:

(1) A university mission statement, such as: "through international contracts, grants, exchange programs, and other faculty involvement and experiences, contribute to the international awareness and acquaintance by students and other clientele, so they think of themselves, within their discipline and otherwise, as functioning in an international

arena and environment." More precise mission statements for colleges of agriculture, veterinary medicine, and home economics would be appropriate.

(2) Goals for the university, colleges, and departments regarding scientist-years of international experience that should exist within the faculty, numbers of undergraduates or graduate students that should be handled, exchange programs for domestic students, volume of AID contract work, or other.

(3) Tenure, promotion, and salary policies that include specific criteria and standards against which personnel in international assignments may be judged. These should be parallel to criteria and standards separately provided for faculty assigned instruction, research, or extension functions. These policies should also provide incentives for service in AID contract programs for longer than 2 years.

(4) Practices in administering policies that visibly illustrate reward for and administrator ability to appraise international service and international programs.

b. Providing for significant "investment equity" in a project by department heads and other key university administrators. This may include:

(1) Include key department heads and perhaps a key central administrator, such as graduate dean, provost or vice president for research, along with the prospective C-O-P, in advance team or teams that

review the country need and prepare the project need statement or project documents.

(2) Formation of an institution "project executive committee" or "project implementation council" for the LOP, and including on it the above persons and a limited number of other key administrators and faculty.

(3) Ensuring that one key administrator--a dean, associate dean, or university-wide officer--carry the responsibility to provide consistency in administrative support and evaluation. Specifically, administrative visits and reviews provided for in a contract should not be considered primarily as an opportunity for a new foreign experience. They should be primarily for a key administrator involved in early stages of the project to assess progress, reinforce objectives, and provide continuity of administrative support.

(4) Providing for new administrators of units that are important to project success some early involvement in the project, perhaps as a member of the committee or council mentioned above, as the second member of an administrative visit team, or as a short-term consultant in a needed area.

c. Including in contracts those features that will contribute to project success and, in turn, to high levels of satisfaction and reward for all project participants. They may include:

(1) Careful attention to project size. Expenditures per year or personnel numbers should be in accord with the size of the effort or future

investment that can be anticipated in the host country, considering federal revenue and other factors. Projects which are within the long-term financing capability of the host country have a higher chance of achieving and maintaining institutional strength and effectiveness over the long term.

(2) Incentives that would encourage 4 to 6-year tours for senior scientists.

(3) A progressive and recorded plan for host-country personnel assuming scientific, program, or unit leadership prior to termination of the project. An example might be:

	Expatriate	Host-Country Counterpart I	Host-Country Counterpart II
Year 1	Research Leader	Graduate Study	Research Assistant
Year 2	Research Leader	Graduate Study	Research Assistant
Year 3	Research Leader	Asst. Research Leader	Graduate Study
Year 4	Research Leader	Assoc. Research Leader	Graduate Study
Year 5	Assoc. Research Leader	Research Leader	Asst. Research Leader

(4) Accommodation in training programs for a slippage of 10 to 60 percent in personnel identified to train for work in the "institution" to be developed. Some will be lost to the private sector, to promotions, or to other public agencies. Ten to 60 percent more should be trained than would be needed at a given time in the institution. Where possible, plan early, in-country training programs for replacements that will, over time, be needed.

(5) A target for the proportion of tenured or tenure track faculty on the contractor's team. It should be about the same as the proportion within the university or involved colleges.

G. Women in Development

The Social Soundness Analysis in the PP calls for all components of the project to ". . . be sensitive to the role women play in the SNL homestead." Being sensitive is extremely important because "women are the mainstay of the SNL homesteads" (PP, p. 39). The Evaluation Team found that the project indeed has been sensitive to the role of women, and the manner in which it has been done is worthy of special recognition. The social scientists have compiled information on who performs specific tasks and makes decisions. Since many males, especially husbands, work in the Republic or elsewhere away from the homesteads, women are frequently the de facto farmers. Project personnel work with males and females on an equal basis, and no evidence of bias was observed. In the Evaluation Team's field visits, homesteader/farmer women were observed participating as equals, and they entered into discussions vigorously.

Many MOAC extension workers are female, and they serve in technical agricultural as well as homemaker advisor roles. Women PCVs have been fully accepted and female Swazis compete on an equal footing for training. One long-term contractor advisor has been female. Additional information is provided in Appendix F (p. F-5).

The Evaluation Team recommends that the project continue to be sensitive to the role and special needs of women residing on the SNL and other women involved in the project in any way.

APPENDIX A

PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Goal: To increase the economic viability of farming on SNL	**Indicators:** 1. Percentage of SNL farms producing primarily for commercial market increases to 20% by 1992 and 30% by 1997. 2. Percentage of SNL farms producing marketable surplus above subsistence needs increases to 60% by 1992 and 80% by 1997.	1. Project on-farm survey 2. Impact Evaluation 3. Swaziland census of agriculture 4. Annual survey of SNL 5. R.D.A. Monitoring and Evaluation Unit reports	**Purpose to Goal Assumptions:** 1. GOS policies will continue to encourage cash cropping. 2. Production inputs continue to be available on a timely basis. 3. Marketing systems can accommodate increase in commercial farm activities. 4. SNL area under irrigation continues to increase.

PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Purpose: To improve and expand the capacity of the MOAC research and extension program to develop and effectively extend cropping systems recommendations relevant to the economic needs of the SNL farmer.	EOPS: 1. Agricultural Research Capable of: a) Conducting economic, social & technical research on a continuing basis. b) Conducting 100 on-farm research trials yearly. c) Producing annual research recommendations designed to provide useful results to extension agents and farmers. 2. Extension Program capable of: a) Conducting 100 on-farm research trials and 160 on-farm demonstrations of research recommendations yearly. b) Conducting annual field days and farmer training sessions. c) Reaching 75% of the SNL farmers yearly with research recommendations. d) Conducting in-service training sessions reaching 50% of the total number of extension workers annually.	1. Project records and evaluations 2. Ag census of SNL 3. Project contractor reports 4. Project on-farm survey 5. RDA Monitoring and Evaluation Unit reports	Output to Purpose Assumptions: 1. Adequate financial resources will be made available to meet MOAC recurrent expenditures. 2. Participants will return and remain in staff positions for which they were trained

PROJECT DESIGN SUMMARY - LOGICAL FRAMEWORK

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	e) Putting research recommendations into a form usable by extension workers and applicable to SNL farmers with various resource constraints. f) Conducting an effective information program to supplement direct extension agent efforts.		

PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

NARRATIVE	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Outputs:	Levels:	Means:	Input to Output Assumptions:
1. On-farm survey conducted on SNL covering: -socio-economic aspects of current cropping systems -technical practices currently used -productivity in selected crops -SNL resource base	1. 1 base line survey and annual updates	1. PES 2. Annual Contractor reports 3. MOAC records and reports 4. Observations	1. The GOS will establisl required posts. 2. Qualified Swazis will be available for training. 3. Posts essential to the project will be fille by qualified Swazis.
2. Scientifically designed experiments conducted at central research stations.	2. X		
3. Scientifically designed experiments conducted at outlying stations.	3. X		
4. On-farm trials	4. 350 trials		
5. Annual Research reports.	5. 5 annual reports		
6. Cropping systems recommendations.	6. X		
7. In-service training program designed and courses conducted for extension workers and other MOAC staff.	7. Program designed and implemented, courses conducted.		

PROJECT DESIGN SUMMARY - LOGICAL FRAMEWORK

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Outputs:	Levels:	Means:	
8. Ag. Information Section converts technical recommendations into form useable by extension agents.	8. X		
9. Ag. Information Section develops and implements communications support program to assist extension service.	9. X		
10. Materials to support extension fields staff produced by Ag Information Section.	10. Field staff using flip charts, posters, bulletins, slide shows and/or other materials in making presentations.		
11. Strengthened linkages between Research, Ag. Info, Extension and Faculty of Agriculture.	11. X		
12. Relationships established with international research organizations.	12. X		
13. Farm demonstration and field days.	13. 320 on-farm demonstrations and 16 farmer field days.		
14. Personnel trained and in place.	14. Research Division, Ag. Info. Section, In-service training section staffed (see inputs) and operating effectively.		
15. Facilities in place.	15. Additional facilities in use (see inputs).		

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTION
Inputs: AID			
1. Technical Assistance	1. 40.75 person years of long-term and 90 person months of consultancies ($8,140,000).	1. Contractor Reports 2. Project Evaluations 3. Observation	
2. Training	2. 54 study years of academic training and 4.75 years of short-term and work/study training ($1,781,000).		
3. Construction	3. - Research library/conference room - Soils lab extension - Agricultural Information Section building - 1 TA staff house - 14 houses for field research teams - 10 field research storage sheds ($640,000)		
4. Equipment	4. Research equipment, lab equipment, agricultural information production equipment, teaching equipment ($280,000). See Annex L for details.		
5. Commodities	5. Research trial commodities, office supplies, teaching materials, information production materials ($612,000). See Annex L for details.		
6. Vehicles	6. - 4 Vans - 6 Pickup Trucks - 2 Station Wagons - 14 Motorcycles ($138,000)		

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
7. Research base-line Survey	7. - Recorder and enumerator expenses - Supplies ($17,000)		
8. Administrative Assistance	8. 1 person for 5 years ($58,000)		
9. Evaluation	9. 1 external evaluation in FY 85 ($48,000)		
10. Contingency	10. ($1,186,000)		
GOS			
1. Salaries	$1,758,000		
2. Vehicle Maintenance, Operation and replacement	$ 437,000		
3. Research Facilities and Office Space	$1,223,000		
4. Housing and Furnishings	$ 369,000		
5. Travel Costs for Participants	$ 122,000		
6. Commodities and Supplies	$ 336,000		
7. Contingency	$ 109,000		
U.S. Peace Corps			
Volunteer Support	Support costs for 4 volunteers for 2 years each - $55,000		

APPENDIX B

SWAZILAND
CROPPING SYSTEMS RESEARCH AND EXTENSION TRAINING PROJECT

Summary of Logical Framework Outputs

April 1982 to October 1984

OUTPUTS: CONTRACTOR

Output: 1. On-farm survey conducted on SNL

a. Baseline survey constructed from data obtained from Swaziland Central Statistics Laboratory. (See EOT reports for Ag. Economist and Rural Sociologist in 1983 Annual Report plus report of W. Grisely, a consultant, in 1982-83 Annual Report).

b. Informal surveys conducted in 3 RDA's in 1982. Formal verifcation survey on 270 homesteads in above RDA's. (See January-March 1984 Quarterly Report). Assessments of farmer reaction to on-farm trials (see EOT report of Rural Sociologist).

OUTPUT: 2. Scientifically designed experiments conducted at central research stations.

a. Agronomy - 8 (see 1983-84 Annual Report). Related to ox planter modifications, problems, etc. and to manure, seed, and leaf analysis.

b. Horticulture - 45 plus several (see EOT report).
   - Introduction of crops
     - Fruit and nut trees - 1
     - Blueberries - 1
     - Strawberries - 1
     - Vegetables - 1
     - Melons - several
   - Variety trials - 30
   - Potato fertilizer - 1
   - Weed control - 3
   - Long day onions - 1
   - Antitranspirants and mulches - 6
   - Seedling production - several

c. Irrigation - 5 (see 1982-83 and 1983-83 Annual Reports). Furrow/ridge trials and trials of evapotranspiration devices.

Output: 3. Scientifically designed experiments conducted at

10U

outlying stations.

a. Horticulure - approximately 12 (see EOT report). Sweet corn at one location and a few fruit and nut trees at each of several locations.

Output: 4. On-farm trials

a. Agronomy - approximately 100 total with data collected from 80 or more. Maize: herbicides, modified ox planter, hand-jab planter, cutworm bait. Dry beans: population (see 1982-83 Annual Report).

b. Horticulture - 71 (see 1982-82 Annual Report and EOT report).
   Introduction of crops
   Fruit and nut trees - 53 (several cooperators with one or a few trees of more than one species).
   Blueberries - 3
   Strawberries - 7
   Vegetables - several
   Cropping plan - 8 in NRDA, several in CRDA, 6 scheduled for NRDA in 1983-84 but were not completed.
   Nematode control - 1

c. Irrigation - 12 (see April-June 1984 Quarterly Report). Studies include plant placement, basin irrigation, and methods of irrigation.

Output: 5. Annual research reports

a. Two annual reports from the CSRAET team have been produced.

b. An annual research report covering all aspects of research conducted by the MOAC has not been produced for several years. A report (REPORT OF THE AGRICULTURAL RESEARCH DIVISION, 1981-1983; edited by J. Pali) is being typeset at this time. A draft is available from the Ag. Information specialist.

Output: 6. Cropping systems recommendations

a. Recommendations are being formulated based on the 1982-83 and 1983-84 cropping seasons. These recommendations have been dissiminated through extension training and on-farm.

demonstrations and research. Several publications are in press.

b. See Output 8.

Output: 7. In-service training program designed and courses conducted for extension workers and other MOAC staff. (See EOT report for Extension Training specialist).

a. 1982-83 -- 12 extension workshops with a total of 171 (45%) Extension personnel reached; 128 (46%) of the frontline staff (individuals working with farmers).
   1) Extension Supervisors Workshop - 44
   2) Horticultural Workshops - 39
   3) Home Economics Workshop - 32
   4) Community Development Workshops - 28
   5) Local Training Days - 28

b. 1983-84 -- 7 major workshops or courses sponsored by Extension Training (see EOT report).
   1) Subject Matter Specialist Workshop - 30(2 days)
   2) Retraining of Redeployed Extension Specialists - 60(12 wk). (See EOT report, Appendix I).
   3) Preservice training for certificate course students - 40(12 mon).
   4) Ecology field course for Extension Officers and RDA managers - 40(4 days)
   5) Pesticide Safety Workshops for Extension and Research Staff(5) - 200
   6) Research methods for research assistants and Peace Corps volunteers - 14(1 week)
   7) Updating Extension workers on on-farm research - 230

Output: 8. Ag. Information section converts technical recommendations into form usable by extension agents.

a. Materials delivered in November
   1) Crop Input Record Book
   2) Extension Crop Record Book
   3) Order Book for Cropping Systems Project
   4) ONION PRODUCTION
   5) BEETROOT & SWISS CHARD PRODUCTION

b. Editing completed; typesetting in process
   1) REPORT OF THE AGRICULTURAL RESEARCH DIVISION, 1981-1983

c. Typesetting completed; artwork/pasteup in process

1) TOMATO PRODUCTION
2) CABBAGE PRODUCTION
3) POTATO PRODUCTION

d. Manuscript on hand; awaiting author's approval
1) CARROT PRODUCTION

e. Manuscripts to be marked for typesetting
1) INSECT AND DISEASE CONTROL PROGRAMS
   a) CITRUS
   b) STONE FRUIT
   c) APPLE
   d) AVOCADO
   e) GUAVA AND BANANA
2) PROCEDURE FOR PRODUCING SEEDLINGS IN TRAYS
3) TRAINING/PRUNING DECIDUOUS FRUIT TREES
4) FERTILIZER RATES FOR VEGETABLES
5) PRUNING GRAPES

f. Slide scripts awaiting translation to siSwati
1) PESTICIDE USE AND APPLICATION ON SNL FARMS
2) SEEDLING PRODUCTION WITH SEEDBEDS

g. Materials back with authors for revision
1) PESTICIDES FOR VEGETABLES AND FRUIT
2) IRRIGATION FACT SHEETS
   a) POTATOES
   b) TOMATOES
   c) CARROTS
   d) CABBAGE
   e) ONIONS
   f) LETTUCE

3) FIELD SUPPORT GUIDES
   a) Field Equipment for the Pocket/Knapsack
   b) Conducting a Method Demonstration
   c) Conducting an Individual Visit
   d) Conducting a Technical Meeting
   e) Tips for Good Telephone and Radio Communications

Output: 9. Ag. Information Section develops and implements communications support program to assist extension service.

a. Radio is the major method by which the MOAC information section attempts to reach mass audicences. Some effort has been made to increase the effectiveness of this effort.

b. See Output 8

Output: 10. Materials to support extension field staff produced by Ag. Information Section

a. See Outputs 8 and 9

Output: 11. Strengthened linkages between Research, Ag. Information, Extension, and Faculty of Agriculture

a. A seminar series was initiated by the CSRAET team with the purpose of bringing together representatives of all of the above groups. Six seminars were held in 1982-83 and 12 were held in 1983-84.

Output: 12. Relationships established with international research organizations

a. The team has worked closely with CIMMYT in establishing a process for on-farm research.

b. Visits to:
   1) International Institute for Tropical Agriculture (IITA) (see 1982-83 Annual Report; D. Daum)
   2) Katumani Research Station - same as above
   3) International Laboratory for Research on animal Diseases - T. B. King

Output: 13. Farm demonstrations and field days

a. On-farm demonstrations (see Output 4)

b. Farmer field days
   1) 1982-83 -- 2
   2) 1983-84 -- 4(approximately 280 in attendance)

Output: 14. Personnel trained and in place

a. See attached - PARTICIPANTS

Output: 15. Facilities in place

a. See INPUT section

INPUTS: AID

Input: 1. Techinical Assistance

a. Long-term

Field Office	18.25 person years
Home Office	5.5 person years
	23.75 person years

b. Short-term — 14.75 person months

Input: 2. Training

a. Academic -- 20 study years completed

b. Short-term -- 0.4 study years completed

Input: 3. Construction

a. Library/conference room - No

b. Soils Laboratory Addition - Yes

c. Ag. Information Section Building - under construction

d. 1 TA staff house - Yes

e. 14 houses for field research staff - 4 completed; 10 under construction

f. 10 field research storage sheds - 1

Input: 4. Equipment -- see Budget Summary and Equipement Lists (attached)

Input: 5. Commodities -- same as Input 4

Input: 6. Vehicles

a. 4 vans - 4

b. 6 pickup trucks - 10

c. 2 station wagons - 0

d. 14 motorcycles - 14

Input: 7. Research Baseline Survey

a. Provided recorder and enumerator expenses plus computer expenses at PSU

Input: 8. Administrative Assistance -- Field Office - 2.8 person years

Input: 9. Evaluation -- November-December 1984

Input: 10. Contingency

INPUT: GOS

Input: 1. Salaries - Paid to counterparts

Input: 2. Vehicle Maintenance, Operation, and Replacement

a. Petrol usually available

b. Vehicle maintenance - unsatisfactory

c. One demolished vehicle replaced

Input: 3. Research Facilities - available

Input: 4. Housing and Furnishings

a. Available

b. Temporary housing at beginning of tour of duty is difficult to obtain

c. Temporary housing at the end of the tour of duty has not been provided.

Input: 5. Travel Costs for Participants -- provided

Input: 6. Commodities and Supplies

a. Lack of allocated funds results in frequent deficiences of commodities and supplies.

Input: 7. Contingency

INPUTS: U. S. Peace Corps

Input: 1. Volunteer support -- provided

PARTICIPANTS

LONG-TERM	DISCIPLINE	TRAINING PERIOD BEGINNING	TRAINING PERIOD ENDING	CURRENT SCHEDULED COMPLETION	TARGET DEGREE	INSTITUTION	COMMENTS
Douglas Gama	Horticulture	8/13/83		8/13/85	MS	PSU	
Donald Hlope	Ag Ed/Ext Ed	8/13/84		12/31/84	MS	PSU	
Zodwa Mamba	Agronomy/Dryland	8/18/84		12/31/84	M.Sc.	TSU	
Basil Maphalala	Ag Economist	8/13/84		12/31/84	MS	PSU	
Themba Masuku	Ag Eng	12/24/82	1/04/84		M.Sc.	U. of Mo.	Employed by MOAC
Sebenzile Matsebula	Ag Ed/Biometrics	8/22/82	6/30/84		MS	PSU	
Elliot Mavimbela	Crop Science	6/07/83	8/05/84		MS	N.C. State	
Themba Mavuso	Horticulture	1/03/83		12/31/84	BS	TSU	
Paul Mkhatshwa	Agronomy	9/06/82		12/6/84	MS	U. of Ga.	
Petros Ntshali	Entomology	8/22/82	8/22/83		MS	PSU	Finished one year only.
Magalela Ngwenya	Agronomy	8/13/83		5/85	MS	PSU	
Edgar Nxumalo	Soil Chemistry	8/27/83		8/27/87	BS	TSU	
Samson Nxumalo	Ag Mechanization	8/13/83		8/13/87	BS	PSU	
Arthur Simelane	Agronomy	1/03/83		5/85	BS	TSU	
Funekile Simelane	Rural Sociology	8/22/82	5/25/84		MS	PSU	Resigned from MOAC
SHORT-TERM							
Jameson Dlamini	Ag Ext Mgt	6/11/84	8/18/84			U. of Mo. - 6/11 - 8/11 PSU - 1 week 8/12 - 8/18	
Setsembile Kunene	Plant Pathology	6/15/83	9/10/83			PSU	
10/31/84							

FIELD OFFICE EQUIPMENT AND VEHICLES
FISCAL YEAR 1982-83

Vendor	Item	U.S. Dollars
Central Transport Adm.	5 Pick-Up Trucks (Ford Cortina)	$ 5,619.81
		5,619.81
		5,619.81
		5,619.81
		5,619.81
	2 Panel Vans (Datsun)	8,757.19
		7,908.85
	2 Ten Seater Buses (Datsun)	8,757.19
		7,908.85
E. Chrambanis	1 Typewriter & 5 Ribbons	1,336.05
Business Machine Corp.	1 Dictating Machine 1 Desk Top Transcription 1 Head Set 1 Foot Control	590.15
Photofix & Sound	1 Tripod	87.45
Etkinds Church St.	3 Camera Lens Filters	31.85
Eriksen Motors	3 Open Canopys for Pick-Ups	1,700.21
Swaziland Ag Supplies	1 Handjet Sprayer	34.88
Business Machine Corp.	1 Portable Typewriter	427.23
Swaziland Warehouse	Irrigation Equipment	441.78
Swaziland Warehouse	Irrigation Equipment	35.56
Swaziland Warehouse	Irrigation Equipment	87.67
E. Chrambanis	2 Photocopiers	7,015.31
Ministry of Agriculture and Cooperatives	4TF (125) Motorcycles 4TF (185) Motorcycles 8 Crash Helmets 8 Saddle Bags	8,420.97
J.A. Phipps	Irrigation Equipment	105.56
Swaziland Warehouse	Irrigation Equipment	19.51
Swaziland Supply Center	7 Visors for Cycles (309)	35.49
Swaziland Secretarial Services	Wharfage for Project Equipment (410)	91.08
?	Spirit Level - Irrigation Equipment (309)	14.68
Swaziland Warehouse	Irrigation Equipment (309)	6.10

Webster's Ltd.	Supplies - 3 Chalkboards, 2 Easels (309)	531.00
Swaziland Ag Supplies	Sprayer	75.60
	TOTAL FOR FY 1982-83	$82,519.26

FIELD OFFICE EQUIPMENT AND VEHICLES
FISCAL YEAR 1983-84

Vendor	Item	U.S. Dollars
S.A. Philips	Nebulizer	$ 396.82
Microware Limited	3 Apple IIe 3 Disk Drives & Cards 3 Apple Stands 3 Monitors 3 80-Column Cards 3 Disk Drives 3 Printer Labels 1 Numeric Keypad 3 Super Serial Cards 1 NEC Spinwriter 1 Printer Cable	13,216.19
Trans Global Removals	Storage Charges for Equipment (410)	126.19
Swaziland Warehouse	Pruning Equipment (4 Pruning Shears)	37.51
Moshal Gevisser (Lesotho) Ltd.	2 Pitman Planters	523.01
Moshal Gevisser (Lesotho) Ltd.	Accessories	110.69
Swaziland Ag Supplies	2 Sprayers	153.11
Microware	6 Batteries 3 UPS 3 Battery Connection Kits	2,160.25
Microware	3 Back Up Power Supply 6 Batteries 3 Battery Connection Kits	4,226.60
Microware	2 Computer Printers 2 Printer Cables	2,549.69
Swaziland Ag Supplies	Irrigation Equipment	865.16
South African Scale Co.	2 Scales	162.48
Central Transport Admin.	4WD Pick-Up	7,100.80
Swaziland Ag Supplies	1 Sprayer	316.65
Trans Global Removals	Wharfage for Project Equipment (410)	157.85
Tibiyo Rennies Ltd.	Charges for Returning Projector to U.S. (410)	219.02
Trans Global Removals	Wharfage for Project Equipment (410)	141.89
	TOTAL FOR FY 1983-84	$32,463.91

FIELD OFFICE EQUIPMENT AND VEHICLES
FISCAL YEAR 1984-85

Vendor	Item	U.S. Dollars	Emalager
Computronics	Calculator (309)	$ 14.13	
Computronics	60 Double Density Diskettes (452)	263.60	
Central Transport Adm.	4WD Truck		7,965.0
	2WD Truck		6,112.0
	Motorcycle		1,268.0
	Motorcycle		1,517.0
	Motorcycle		1,517.0
	Motorcycle		1,517.0
	Motorcycle		1,517.0
	Motorcycle		1,517.0
Tibiyo Rennies Ltd.	Delivery Charge for Strawberries (410)	142.68	
Instruments & Control Systems	1 Watchmen's Clock	535.75	
	6 Station Boxes		
	6 Station Keys for Night Guards		
All Stationery	Safe	301.14	
Central Transport Adm.	2 Vehicles		15,200.0
Mitchell Cotts Swaziland	1 Saddle Bag	305.00	
	6 Crash Helmets		
	6 Motorcycle Gloves		
	2 Visors		
Manica Freight Services	Storage & Handling for Planter (410)	31.74	
S.A. Philips	Repair of Atomic Absorption Spectrophmeter (371)	167.20	
Tibiyo Rennies Ltd.	Handling Fees for Blueberries (410)	35.99	
	TOTALS FOR FY 1984-85	$1,797.23	38,130.0

TOTALS FOR FISCAL YEAR	U.S. DOLLARS	EMALAGENI
1982-1983	$ 82,519.26	
1983-1984	32,463.91	
1984-1985	1,797.23	38,130.00*
TOTALS	$116,780.40	38,130.00*

*NEED RECEIPTS

EQUIPMENT FOR HOME OFFICE
FISCAL YEAR 1982-1983

Vendor	Item	Amount
Micron Corp.	Weed wiper, etc.	$ 168.45
47th St. Photo	Cameras	1,557.00
Hoyers	Film	403.92
Smeltzer	Nozzles, etc.	37.20
Earthway	Garden seeder	50.35
Rinchem	Black light	130.00
CNI	File cabinets	915.24
Buckingham	Light table, etc.	410.13
Dick Blick	Silk screening	687.00
State College TV	Megaphone, slide projector	1,713.88
Multiplex	Cabinets, etc.	3,089.31
Wilkinson	10 Calculators	139.50
State College TV	Projectors, overhead, cases	4,065.92
Hoys	Preparation for shipment to Swaziland	345.00
Whitehill	2 Generators	1,485.00
Garden Way	Troy-bilt horse, etc.	3,086.00
Allan	Jab planter	161.03
NASCO	Corn sheller	49.49
State College TV	Zoom lens	258.40
IMAC	Software/field	224.60
Designware	Software/field	289.50
Mace	Software/field	177.25
Computer Store	Software/field	1,152.13
Jensen	Software/field	302.00
Designware	Software/Morrow	27.50
A.B. Dick	Duplicating	1,039.65
Campus Stereo	Tape recorder	74.64
Hoy Transfer	Preparation/equipment	755.00
NASCO	Soil samplers	48.63
Designware	Software/field	570.00
Designware	Software/field	90.00
Designware	Software/field	44.00
Int'l. Inst. of Trop Ag	Rotary planter	780.00
Navtrans Int.	Shipment/equipment	4,081.16
	TOTAL FOR FY 82-83	$28,403.88

EQUIPMENT FOR HOME OFFICE
FISCAL YEAR 1983-1984

Vendor	Item	Amount
Dr. G.J. Buhyoff	Software/field	$ 30.00
Designware	Software/field	135.00
Designware	Software/field	188.00
Designware	Software/field	100.00
General Stores	Software/field	50.60
General Stores	Shovels & tape	54.21
Soiltest, Inc.	Soil testing equipment	994.31
Forestry Suppliers	Leveling rods, etc.	753.00
Fischner & Porter Co.	Flumes	4,466.70
Indiana University	Audiovisuals	1,055.00
Dickey John	Moisture meter	520.76
Custom Laboratory	Lab equipment	3,767.74
		1,080.00
Cole-Parmer	Lab weight sets	68.13
General Stores	Software/field	86.48
Bountiful Ridge	Trees	4,525.65
		574.34
Designware	Software/field	110.00
Film Centre	Camera	543.36
Film Centre	Camera	347.49
Hoy Transfer	Preparation	100.00
Action-Research Northeast	Software	362.20
Navtrans	Shipment	1,752.38
Thomas Scientific	Weight sets	15.41
		25.42
		110.16
Bunting Nursery	10,000 Strawberries	2,894.17
Arthur H. Thomas	Equipment	876.00
VWR Scientific	Equipment	54.09
Sears	Tools	376.73
Navtrans	Shipment of equipment	906.78
	TOTAL FOR FY 83-84	$26,924.11

EQUIPMENT FOR HOME OFFICE
FISCAL YEAR 1984-1985

Vendor	Item	Amount
Earthway Products	Seeder, fertilizer applicator, seed plates	$ 113.26
General Stores	Diskettes	241.58
Garden Way	Belts & bolo tines	174.95
E.C. Geiger	Respirators, goggles, coveralls (10 pair)	177.14
Industrial Products	Tyvek coveralls (50 pair)*	1,260.06
VWR Scientific	Equipment	24.02**
	CURRENT TOTAL FOR FY 84-85	$1,991.01

*Shipped 13 boxes too many
**Balance of P.O. on FY 83-84

TOTALS FOR FISCAL YEAR	AMOUNT
1982-1983	$28,408.88
1983-1984	26,924.11
1984-1985 (Current)	1,991.01
TOTAL	$57,324.00

APPENDIX C

PARTICIPANT TRAINING

The Project Paper called for 54 study years of academic training and 4.75 years of short-term and work/study training ($1,781,000). To date, four long-term participant trainees and three short-term ones have completed their training and returned to Swaziland (see Table 1).

One of the returning participants has left the project and is working in the private sector. Another asked to be transferred from the station where her counterpart is located. A third has been in-country since August 1984 and has not been paid. These pose major problems in trying to institutionalize the project. One suggested solution is to provide added incentives, i.e., pay increases, etc., upon return to Swaziland. This solution, however, is not an easy one to implement. The civil service system, Establishment and Training (E&T), is somewhat rigid and lockstep, and any change to improve financial job incentives takes time and has potential repercussions on all government posts. The GOS is under severe financial constraints, and the problem of retraining personnel is not unique to CSR/E.

One of the long-term participants returning with a master's degree left the project, but is still in GOS service. One did not rejoin the project. This poses a serious problem in terms of training qualified Swazis for key research positions, and is a serious constraint in terms of delaying the institutionalization of FSR/E. The GOS should study

and implement means to retain both long- and short-term trainees on the project.

A total of 20 participants were to receive overseas academic training. To date, 17 individuals either have been trained and returned or are in training (Table 1). The project has maintained a tight schedule in getting people trained. MOAC officials and Chief-of-Party King should be complimented for getting the long-term participates underway at such an early date. To date, 20 study years of academic training and .4 study years of short-term training have been completed at a cost of $273,290 or 21 percent of the $1,286,759 alotted for participant training. It appears that all long-term training should be completed during the 5-year duration of the project. Five additional long-term participants have been identified and are scheduled to depart by late 1984 or early 1985. The identification of a candidate in extension training at the M.S. level should be done as soon as possible. The organization of a predeparture orientation for long-term participants has been very successful and should be continued.

A total of 4.75 years of short-term training and work study was approved under the project. To date, two Swazis in extension management and plant pathology have been trained. This represents 5 months of short-term training. Four short-term participants have been identified to be trained in CSR or FSR.

There is a critical need to identify and send short-term participants for training. Especially critical are the FSR/E, librarian, agricultural information, and agricultural statistics positions. It is crucial for

Swazis to learn more about FSR methodology and, in turn, work with and train others in the application of FSR methodology.

There is a critical need to train both short-term agricultural information personnel and a librarian as the completion of the new facility draws near. There have been problems in getting paperwork and approval for candidates cleared through E&T. Some candidates have not yet been identified. Travel is paid for both long- and short-term participants by GOS. It has been reported that delays in approval of short-term candidates has been linked to lack of GOS funding for travel. Major efforts by both Swazi and U.S. advisors should be made to identify candidates and make arrangements for their short-term training. A recommendation from the Extension Unit is to provide short-term FSR/E and extension training for the Senior Agricultural Officer (SAO) and four Senior Extension Officers (SEOs). The SAO and SEOs are key individuals in the FSR/E linkage. Subject Matter Specialists (SMSs) at district and national levels working with FSR/E Teams should participate in short-term or in-country FSR/E training.

Some six to eight Swazis connected with the project have received short-term training in FSR and other subjects. This training has been funded through CIMMYT and other international organizations. Further development of these types of opportunities should be encouraged.

An additional training consideration is apparent. Long-term participants should receive some in-depth training in FSR/E while in the United States. There are a number of opportunities for this type of training. The University of Florida, Colorado and Washington State Universities, USDA, and

other institutions offer training of this type. It is generally of relatively short duration--up to a month. It is deemed critical to have Swazis in training, or who will be sent in 1985, participate in FSR/E training. It would accelerate both the understanding and impact on the institutionalization of FSR/E upon their return. Additional attention should be given to sending short-term participants for CSR or FSR/E training in the African region. The International Livestock Center for Africa (ILCA), CIIMMYT, and the International Center for Agricultural Research in the Dry Lands (ICARDA) are important international centers where training can be accomplished. Another alternative would be to bring an FSR/E training program taught by specialists from those institutions to Swaziland. Long-term involvement and support from such an institution should be developed. The planned budget is well on target in terms of expenditures for long-term participants, but increased importance must be placed on short-term training.

APPENDIX D

EVALUATION SCOPE OF WORK

The following is the scope of work for the evaluation. The Evaluation Team will:

A. Review the appropriateness, timeliness and quality of U.S. and host country inputs and the validity of the assumptions stated in the logical framework; and provide a detailed explanation of the reason(s) for any short-comings together with recommendations for overcoming them.

B. Review project outputs as stated in the logical framework and, while noting relationship between inputs, outputs, and output assumptions, quantify progress made towards achieving output indicators and provide a detailed explanation of those areas where project outputs either exceeded or fell short of projections. Recommendations for overcoming shortfalls should be included. The review of the validity of output to purpose assumptions will be critical to the purpose and utility of the evaluation.

C. Review the project purpose and note the extent to which project inputs and outputs are, or are not, leading to the achievement of that purpose by the project assistance completion date (PACD). Since this is primarily an institution-building project, the team will be expected to assess the capacity of Swazis working in the MOAC to carry out the key tasks associated with the institution.

The primary focus in these section of the report will be to detail the progress made by Swazi staff in the research station, training section, in acquiring skills necessary to carry out all aspects of their work, the adequacy of plans for assuring that the institutions will be viable by the end of the project, and where shortcomings are noted, to make definite recommendations for achieving viable institutional capacity by the EOP.

D. Review the goal of the project and state the extent to which the activities under the project are or are not leading to the achievement of the project goal. The review must also examine the validity of purpose to goal assumptions.

E. Critically assess the continuing validity of the outputs, purpose, and goal of the project, given progress and changes in conditions since the PP design, and make recommendations for changes, as appropriate.

F. Assess the appropriateness and/or validity of the: (1) Selection of the participating farmers; (2) identification of priority farm problems and the selection of the research agenda; and (3) commodities selected for the local markets.

G. Assess the degree and effectiveness to which this project has developed linkages among scientists, extension workers, and farmers."

H. (1) Determine the relevance of, and results achieved in, each of the eight technical program areas: Farming systems, agronomy,

horticulture, irrigation, rural sociology, agricultural economics, extension training and agricultural information; and (2) evaluate the appropriateness of the number and the professional disciplines of the technical staff.

I. (1) Assess the MOAC capacity to provide livestock research and extension; (2) assess the links to the cropping systems research; and (3) make recommendations, if appropriate, on whether or not an expanded livestock research and extension program should be included either at the latter stages of this project or as a follow-on effort.

J. Assess the flow of information into and out of the research systems, e.g., is the project in touch with world literature and getting information pertaining to recent research achievements into the hands of the farmers as well as national decision makers?

K. Assess the effectiveness and appropriateness of the project's training programs, e.g., can the training officer handle both ministry-wide and extension in-service training?

L. Assess the effectiveness of, the support for, and the participation of Peace Corps Volunteers.

M. The BIFAD representative has been invited to participate in the evaluation in order to make an overall assessment of the project'sconsistency with and the quality of its performance with respect to the objectives of Title XII of the Foreign Assistance

Act. (Both The Pennsylvania State and Tennessee State Universities are "Title XII" universities.) Technical, administrative, and managerial aspects (including USAID/university interrelationship and field and campus support of field personnel) should be examined. It is also expected that this field evaluation will provide the BIFAD representative an opportunity to gain insights into ways in which the Title XII community can further improve efforts to support AID's food/agriculture/nutrition programs overseas.

APPENDIX E

RECOMMENDATIONS

Recommendations for the Agricultural Information Service

1. An important priority of the AIS should be to develop and publish materials which communicate the farming systems research (FSR) results to extension workers and farmers. A second priority is the development of FSR/E training materials that can be utilized in the training of all research and extension personnel working in FSR/E. The AIS should also provide leadership in meeting MOAC-wide agricultural information needs.

2. Consideration should be given to the development of jointly developed work plans for the unit. All members of the unit should be involved at appropriate times in both the development and evaluation of the work plan. The work plan should be results oriented and tied to the individual performance appraisal of each unit member.

3. A training plan needs to be developed jointly for both long- and short-term participants of the unit. Results and outcomes of the training should be specifically and clearly outlined in the plan as to how the training will benefit AIS and the project. Results and outcomes of training need to relate to individual position descriptions.

4. Positions descriptions should be developed for each member of the unit. The position description should follow the same outline as the position description for the Publications Officer.

5. Production and distribution of the MOAC newsletter should be continued. An informal assessment indicates the newsletter is an effective means of communicating on-farm trial research results, MOAC policy and procedures, monthly training events, and other types of organizational news. The newsletter also appears to be an effective means of soliciting feedback from field staff.

6. The distribution procedures for publications should be carefully studied and analyzed. The current plans are to distribute fact sheets through the MOAC newsletter or via RDA PMs to frontline extension workers. To date extension workers have very little or no printed research based information upon which to make recommendations to homesteaders. It is essential to evaluate the distribution system so as to insure the timely arrival of printed materials to field workers.

7. The organization of an Educational Materials Committee needs to be implemented. Committee membership should include both research and extension personnel. Major responsibilities of the committee should include evaluation of materials before final publication; prioritization of FSR research results for publication; recommended formats for research materials for both extension workers, research personnel, and farmers; specific responsibilities for each individual

involved in the production process; and the development of a production schedule outlining the sequential steps involved in the production of printed materials. The committee would be advisory to the AIS.

8. A computer-based, indexed system to compile and inventory on-going research in the country should be developed. This could serve as a useful reference to AIS staff in contacting researchers at appropriate times to obtain research results for timely publication.

9. The use of radio should be expanded to diffuse FSR results and recommendations. The MOAC has air-time available each day.

10. Research needs to be conducted in terms of identifying sources and channels of agricultural information preferred by homesteaders. Research in this area would be useful to identify those methods most preferred by homesteaders in learning new agricultural information.

11. The development of fact sheets written in siSwati for farmers should be encouraged.

12. The co-authorship of FSR-based fact sheets and other publications between Research Officers (ROs) and SMSs needs to be encouraged. Appropriate national and district SMSs could work with ROs in the development of printed publications. This is one means of strengthening the research-extension linkage.

13. There is an increasing need to develop simple and inexpensive teaching materials for extension workers. Efforts should be made to develop flip charts and other types of durable and inexpensive teaching materials for frontline extension workers.

14. FSR/E training modules (slide-tape) need to be developed for training research and extension personnel. A series of FSR/E training modules can also be obtained from the University of Florida. FSR/E training materials from the IARCs should be identified, and appropriate training materials obtained to support project training efforts.

15. The organization of an FSR/E information resource library or center in each RDA headquarters should be considered. This is simply a collection of relevant printed FSR/E research materials and training aides that could provide easier access to RDA and extension personnel.

16. Development of a comprehensive list of equipment and supplies for the AIS needs to be made. This is especially essential when planning for the move to the new AIS post in the new building to be completed in 1985.

17. Plans to bring short-term consultants in audio-visual aids, publication writing, and library services need to be finalized. These short-term consultants will provide important on-the-job training for Swazi members of the AIS and other members of the FSR/E Team.

18. Identification of participants for short-term training should be completed as soon as possible. Appropriate agricultural information training opportunities available in Africa or through international IARC's of other agencies should be considered for AIS staff.

Recommendations for Training

In order for Swaziland to realize the project goals and more nearly achieve its full development potential, the following are recommended for all aspects of training for the project:

1. The in-service training program for FSR/E must be strengthened and expanded to support the national effort. Recepients of this training should include ROs, RAs, PCVs, extension personnel, and Penn State advisors.

2. An in-service training plan for FSR/E should be jointly developed by research and extension personnel. This should be part of jointly developed work plans (research, extension, and project personnel). Dates, location, activity, participants, instructors, and source of funding need to be indicated in the plan. Curricula and teaching plans must be jointly developed and taught in a multidisciplinary approoach.

3. Key MOAC decision makers should participate in an executive FSR/E seminar sponsored by an international research organization. These

decision makers need to clearly understand the FSR/E methodology and approach if FSR/E is to become institutionalized in Swaziland.

4. The technical assistance in FSR/E methodology needs to be obtained from an international research center such as ILCA or CIMMYT. These organizations can provide the technical assistance needed during the LOP. TA should include development of an FSR/E methodology adapted to Swazi conditions, development of FSR/E work plans, training needed to support the effort, and development of an evaluation and monitoring system to assist in evaluating project programs.

5. Long-term Swazi participants should receive training in FSR/E sometime during their 2-year academic program in the United States. Penn State needs to make arrangements for the training.

6. Penn State advisors should receive training in FSR/E methodology prior to their departure from the United States. In addition, they should participate in FSR/E training opportunities where appropriate in Swaziland or at IARCs.

7. Training plans for both long- and short-term participants need to be jointly developed for both research and extension personnel. The plan should clearly indicate the type of training to be received, the post to be assigned upon return to Swaziland, and the anticipated benefits to Swaziland and the project as a result of the training.

8. The GOS needs to develop strategies and procedures to assure the retention of both long- and short-term participants in the project upon their return to Swaziland.

9. Both the GOS and Penn State jointly need to identify rapidly candidates for short-term training. This phase of the participant training program has fallen behind schedule. Candidates must be identified, appropriate training opportunities planned, and anticipated benefits to Swaziland and the project clearly outlined. Constraints which limit the participation of short-term participants should be identified by GOS and project personnel, and appropriate solutions developed to ensure completion of the short-term training goal and commitment.

10. A centralized resource center or office should be the clearing house for all short-term training opportunities. This most logically is the Extension Training Unit. An appropriate networking system and procedures should be established so that short-term training opportunities can be identified and rapidly communicated to appropriate units and personnel.

11. All short-term FSR/E training opportunities should be identified and communicated to project personnel. Many of the institutions and agencies which sponsor these activities cover the major costs involved.

12. The annual orientation for out-of-country trainees should be continued.

13. An advanced training process should be formulated. The creation of an MOAC Training and Scholarship Committee composed of the four division heads and the ATO. One of the duties would be to solicit a pool of qualified candidates for external training.

Recommendations for Extension

The original purpose of the project was "to improve the capacity of the MOAC research and training programs to develop and effectively extend cropping systems recommendations relevant to the needs of the SML farmer. It was recognized that the development of a viable and integrated program and extension capable of providing new technologies relevant to farmers' needs is essential to attaining this objective. A number of positive output indicators attest to the progress made by the Extension Training Unit during the first 2.5 years of the project. There are a number of recommendations made in this report which can strengthen the extension training effort.

1. The Extension Training Unit must as its major responsibility coordinate all of the training for the extension program, conduct survey/studies to determine the needs, and coordinate with other institutions that train extension personnel. Training must be relevant, timely, and systematic. FSR/E training is considered part of the in-service training effort.

2. Additional staffing of the Extension Training Unit is essential to adequately support FSR/E training efforts and to carry out other

important MOAC training activities. Basic to this recommendation is training the new assistant agricultural training officer (AATO) to take over major responsibilities for preparing the Training List.

7. The Extension Training Unit should continue to be involved in the design, organization, and evaluation of FSR/E training. Members of the unit should participate in a basic FSR/E workshop, and receive training in the design and organization of FSR/E training from specialists at one of the African IARCs.

8. Efforts need to be made by the Extension Training Unit to work with the University of Swaziland (UNISWA) to study the feasibility of including FSR/E as part of the certificate level curricula.

9. Research in identifying preferred channels and sources of agricultural information used by Swazi homesteaders should be carried out in cooperation with AIS. The research results should indicate educational formats that can be used by extension workers and AIS in teaching farmers.

10. Extension SMSs and ROs should receive training in writing publications and to target their publications for specific audiences. This training should be arranged through the training unit.

11. Supervisory training should be organized for extension supervisors, RDA PMs, and extension workers (EWs) who may move into managerial

posts. Training should cover personnel management, administration, financial management, and time management. If the supervisory staff is expected to effectively follow-up and train the field staff, they must be given training to that effect. Training can be arranged through the Swaziland Institute of Management and Public Affairs (SIMPA).

12. To increase the effectiveness of FSR/E training on the district and local level, each district should have a training specialist. There is a lack of a comprehensive training program at the district level, and it is deemed necessary to increase the availability of assistance at the local level. The District Specialist would assist in organizing FSR/E training programs and coordinating FSR/E activities at the district level. Other duties would include assisting the local supervisory staff in conducting monthly and bi-monthly training as called for in the T&V system. In addition, they would assist District SMSs in conducting training for the extension staff and assist the Farmer Training Center (FTC) in preparing training for extension personnel. The district training specialist could be recruited from the ranks of the District SMSs. This position is viewed as a critical link in strengthening the FSR and extension link.

13. The Extension Training Unit should encourage the FSR group to use data collected by the monitoring unit. There is a need for integration of this type of activities.

14. Relevant short-term external training opportunities should be identified for members of the Extension Training Unit as well as other extension personnel.

15. Development of extension training materials for all levels of extension personnel should be continued. Special emphasis in training should be placed on extension methods appropriate for specific audiences.

16. It is recommended that each district organize a Research Input Committee whose membership includes extension personnel. These committees would make annual recommendations to the research staff at MRS about extension's concerns and ideas for research.

17. FSR and research seminars should be conducted at MRS or other appropriate sites for other researchers and senior extension staff. This would provide senior research staff to liaison with their counterparts in extension.

18. Efforts should be made to explore the possibility of organizing training for SMSs through the SADCC countries and to encourage networking with their counterparts in sub-Saharan Africa.

19. Work should continue on development of the training information record form, Swaziland Extension Guide, and Program Planning Workbook.

20. The study and identification of the specific skills and competencies needed by Swazi EWs to perform effectively on-the-job should be conducted. These include technical subject matter, FSR/E, and extension (teaching, methods, etc.) competencies. Glen Easter is in the process of completing his Ph.D. research on the subject. The results of the research should be utilized as part of the data base for developing relevant in-service training programs. Training modules should be developed from this competency based study.

21. Training in teamwork and joint decision making should be provided for key project personnel. Concepts, skills, procedures, and strategies for developing effective teamwork should be the core of the training. This type of training is viewed as key to the institutionalization of FSR/E. Modules on team building have been developed at Washington State University.

22. A study of the extension management and organizational system should be conducted to identify how key operational variables work and are utilized within the system. Variables include leadership styles, communication patterns, control, etc. The results of the study would be useful to the Swazis in developing outlines and strategies to improve their organization and management system. Training needs could be identified from the study.

23. Advanced in-country academic opportunities need to be developed for extension personnel. Currently, RAs, EWs, and EOs, have practically

no opportunities for advance study beyond the certificate and diploma level. Most frontline workers are certificate graduates. The Extension Training Unit should explore the possibilities with UNISWA to see if arrangements could be worked out to teach academic courses at RDA project headquarters or FTCs. If this system could be institutionalized, an agent might be able to complete many requirements toward an advanced degree over time. Policies, procedures, and financing of this effort need to be developed by the MOAC. This would serve as an incentive to field staff and provide additional means for upward mobility.

APPENDIX F

SCOPE OF WORK REVIEW

The Evaluation Team was provided a Scope of Work by USAID (see Appendix D). In this part of the report, each item in the Scope of Work is listed in abbreviated form and either citations are made to the report or the required information is provided.

A. Review the appropriateness, timeliness, and quality of U.S. and GOS inputs and validity of the assumptions stated in the logical framework; and give reason(s) for shortcomings with recommendations for overcoming them.

The Evaluation Team's observations and recommendations concerning this question are covered in detail in Section VI.

B. Review project outputs; note relationship between inputs, outputs and output assumptions; quantify progress made; and review validity of output to purpose assumptions.

The present status, conclusions and Evaluation Team recommendations are presented in Sections V and VI.

C. Review the project purpose; assess the capacity of the Swazis working in the MOAC to carry forward; note progress made by the Swazi staff; and make recommendations for institutionalization.

Section IV (Project Setting) initiates the discussion on project purpose, and Sections V and VI of the report cover these in detail.

D. Review the goal of the project and examine validity of purpose to goal assumptions.

Project goals and their assumptions and indicators are addressed in Sections IV, V, and VI of this report.

E. Critically assess the continuing validity of the outputs, purposes, and goal of the project, given progress and changes in conditions since the PP design.

The Project Setting, 1984 (Section IV) and the Project Design in Retrospect (Section V) deal with the adequacy of the goal, purpose, and purpose to goal relationship. The introduction and parts A, B, and C of the log frame analysis in Section VI covers the relationship of outputs to purpose.

Briefly, there has been great change in the project setting, but a project of the FSR/E type is as badly needed today as it was when the PP was prepared. The goal is appropriate and no change is recommended. The objectively quantifiable indicators for goal are not adequate, and a project mid-term update/revision is recommended. There are problems with the assumptions and recommendations are made for two of them.

The purpose is and will continue to contribute to goal achievement, but a changing environment (see Section IV) and lessons learned to date in the

project and in FSR/E projects elsewhere indicate the project should be expanded to include livestock. Cropping cannot be viewed in isolation from the whole homestead/farm. A holistic approach vis a vis the homestead is required. Therefore, it is recommended that the purpose statement be interpreted to mean a farming systems research and extension system will be utilized, but major emphasis will remain on crops and livestock research will be limited to that which is absolutely vital to farming systems analysis.

Problems exist in the output to purpose assumptions, and recommendations concerning them are made in Sections IV and V. Briefly, to date, two of the key returning participants trained in academic institutions have been lost to the project, and another participant has not yet been integrated into the CSR/E Team. GOS, perhaps with assistance from the Penn State Team, must solve the personnel problem by creating an invigorating work environment in which Swazis want to remain. This calls for the establishment of posts attuned to the farmin systems approach in both research and extension, meaningful assignments, and adequate salaries. The returning participants must be treated as professionals and given roles befitting persons with their training in their culture and socioeconomic system. As a last resort, GOS may need to require a signed pledge (bond) that participants will remain in the post for which they are trained prior to their departure. However, if the bonding approach is utilized, it must not become a device through which employees are "locked" into positions in which they feel they are being taken advantage of and in which there is no recourse.

F. Assess the appropriateness and/or validity of the:

1. Selection of the participating farmers.

2. Identification of priority farm problems and the selection of the research agenda.

3. Commodities selected for the local markets.

The PP states:

> The project is designed to overcome three basic constraints to increasing small farmer incomes in Swaziland: (1) Lack of relevant research recommendations; (2) the inability of the extension service to effectively motivate farmers to adopt improved farming practices; and (3) the lack of adequate field support for extension workers in the form of extension and teaching aids.
>
> The research component of the project will focus on an analysis of the systems within which small farmers operate and the development of cropping recommendations relevant to their situation. Research activities during Crop Year (CY) 1982-83 will be planned based on initial observations of cropping constraints in Swaziland and at international agricultural research centers.
>
> Target groups of farmers with similar production constraints (e.g., rainfall, soil fertility, economic resources) will be chosen through a series of surveys and discussions by all members of the CSR/E Team. Research will be designed within the constraints of the farmer and will not be a series of highly sophisticated experiments with elaborate experimental designs. Instead, they will be simple, straightforward experiments that are understandable by the farmer and would be replicable by him/her. Experiments will be placed only on the farms of those farmers willing to participate in the research.
>
> The concept of a systems research approach demands that the entire farming system must be studied and not just a subsystem such as cropping or livestock. The surveys and research trials conducted during the project, while emphasizing crop production will certainly focus on the interrelationships between the crop and livestock subsystems.

The Evaluation Team feels that recommended FSR/E procedures for farmer selection and the identification of priority farm problems and the

preparation of the research agenda are being followed by the project team in the CSR/E rain fed agricultural areas. The major farmer constraints pointed out in the baseline data and subsequent surveys and analyses have given the researchers sufficient insights into farm production problems to enable them to properly focus the rain fed agronomic work thus far.

In the horticulture and irrigation sections of the CSR/E Project, a systems approach has also been applied, but because of the lack of sufficient information in the local knowledge base, more effort has gone into the development of on-station research than the Evaluation Team feels may be desirable. On-farm research must be the focus for all programs. What has been done follows accepted procedures and the work plans for 1984-85 call for much more on-farm research activities.

Farmer selection during the remainder of the project will become much more critical as system improvements or alternatives are verified and the project moves into the validation/transfer stages. Here, a specific user profile will become a more important factor than the measurements which are presently being used. The integration of the EWS into the validation and transfer process will also impact heavily upon project success and farmer acceptance of the technology.

The Evaluation Team was very favorably impressed with the number of women decision makers (farmers) who are included in the program. The substantial number of GOS EWs who are women, and the presence of women among the PCVs and those serving as project personnel is impressive.

Commodities selected for the local vegetable market seem to be of some question. As mentioned in the assumptions section, marketing can be, and is, a constraint to selection of commodities within the improved systems. The marketing and storage problems need attention.

The question of livestock subsystems is also an issue that must be dealt with during the remainder of the project. It will be difficult to initiate a mixed systems research approach at this point and complete the job by the EOP. Livestock should be noted and dealt with, but only when necessary to utilize a holistic approach. For example, oxen power is needed for cropping activities, so it must be considered. While livestock must be considered, it is not felt that a major shift can take place during the remainder of the LOP and move completely away from a CSR program to a complete FSR/E approach. If there were more open long-term positions in the contract and if the GOS counterparts were trained and working in the FSR/E program at this time, this situation might be different.

G. Assess the degree and effectiveness to which this project has developed linkages among scientists, EWs, and farmers.

The Evaluation Team was impressed with the general knowledge about the project at the MOAC administrative levels. Directors, section chiefs, and other managers were well informed on project purposes and goals. However, the Evaluation Team was unable to detect formal linkages of the type needed between divisions at the middle levels. At the site locations, the RDA managers and SEOs were also knowledgeable about the aims and purposes of the project. Again, there were no formal working agreements between the

research technicians and the extension staff. In some cases, collaboration was taking place, but in an informal mode. Positive linkages were quite evident within the research circles in Swaziland and to some extent, between research and the university agricultural staff on an informal basis. Project personnel seemed to have excellent working relationships with the collaborating homesteaders.

The research staff is in the process of establishing linkages with international centers working in this region, as well as with other FSR/E programs/projects in neighboring countries. This networking is seen as quite positive and several activities are planned by the Penn State and MOAC Teams for 1985. Many regional training activities are available and should be taken advantage of during the coming years.

Linkages within MOAC are being facilitated through the publication of the MOAC newsletter, which is distributed to all MOAC employeees. The formation of an Educational Materials Committee, composed of research and extension personnel, is another positive step in formalizing research-extension linkages.

Stronger, formal working relations and linkages must be built between extension and research in Swaziland if FSR/E is to be an effective program and become institutionalized during the LOP. In the remaining LOP, the forging of the needed linkages should be given high priority. The Contractor Team C-O-P should assume the major responsibility. The GOS must become aware of the implications of this need for research-extension linkages so as to have sufficient research recommendations available at the

RDA and site-specific level for use in their new T&V extension program. EOs must become a vital part of the FSR/E methodology and must have sufficient time allocated for these activities.

H. Determine the relevance of and results in the eight technical areas; evaluate the appropriateness of the number and the professional disciplines of the technical staff.

Human resources that were allocated to the eight technical program areas were described as follows in the PP:

> The long-term implementation (technical assistance) for the research portion of the project will consist of six individuals:
>
> - General cropping systems specialist (chief-of-party)
> - Cropping systems agronomist
> - Cropping systems horticulturist
> - Irrigation specialist
> - Agricultural economist
> - Rural sociologist
> - Short-term technicians as needed
>
> The Government of Swaziland will transfer five Crop Production Specialists from the Crop Production Section of the MOAC to the Research Division to serve as counterparts to AID-funded technical assistance team. In addition, the GOS will establish five positions in 1982 and five in 1983 for field research assistants.

The GOS further agreed to supply technicians to establish an in-service extension training division and to reinforce the AIS.

Technical Program Areas

The job descriptions in the PP are very specific about the first three technical program areas. All call for cropping systems experts, with

production backgrounds in agronomy and horticulture, to be provided by the contractor. This was seen by the Design Team as necessary to implement a strong FSR/E methodology and move this new philosophy into a ministry-wide research approach. The contractor was unable to fill all of these critical posts with FSR/E experienced personnel and some of the confusion about farming systems research approaches that the team has had can be attributed to this missing element. The project team has to a great extent gone its own way in working out a systems approach. Some excellent results have been obtained, but prior experience and training in FSR/E would have been very helpful. Perhaps, if a well defined FSR/E methodology had been used by all members from the start, some of the present data gaps would not exist. The Evaluation Team feels that during the first 2.5 years of the project, the technical assistance mixtures and numbers as designed for the project were proper. However, it has been suggested by the Evaluation Team that certain other technicians be included on the contractor's team in the last half of the project and that every person be experienced or trained in FSR/E before arrival in Swaziland.

The Evaluation Team was very impressed with the field research assistance and coordination efforts of the PCVs. Without this vital support and technical element, the project progress would not be at the levels observed at this time.

1. Farming Systems: As an art or science, the project approach still has improvements to make. The use of a multi-disciplinarian team approach working in the various recommendation domains is still largely in the development stage. The integration of all the actors from within the

project, as well as those of the MOAC extension staff, still remains to be accomplished. Data and information systems that will assist in the identification of analogous areas and provide rapid extrapolationtechniques should be developed.

A project specific methodology for validation and transfer activities in which the local EW is a key resource person and the technician in charge of the research sites for this stage of FSR/E has not been developed or tried. Strong leadership for the remaining LOP from an experienced farming systems research and extension expert should be of prime importance to the contractor and USAID.

2. Agronomy: Perhaps the highest returns for the CSR/E Project in Swaziland will be from improved systems in the rain-fed project domains. The agronomy technical area in the project has made excellent strides. Not only have the research trials and investigation strategies started to show results, but the instructional activities and in-service training for the CSR/E field staff have been quite positive. RAs have been trained, as well as PCVs, and they are at present working in four different locations. Several key production constraints in basic food crops have been identified and investigation trials may lead to solving them. In addition, other constraints that may impact on identified high priority homesteads/farms are being studied.

3. Horticulture: The horticulture technicians modified the CSR/E approach and have utilized a more top-down one to solving the farmers' problems. Attention in horticulture is focused on irrigated areas. Since

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irrigated agriculture in the SNL programs is much newer and the systems they represent have not stabilized (constraints may be due primarily to low technology knowledge levels and not internal or external factors), it is recognized that as yet it may be difficult to apply a "normal" FSR/E approach.

To the present time, much has been learned about Swaziland horticulture by the project team. FSR/E methodology should now be applicable; however, whether the Swazi colleagues will be able to carry on this activity in a CSR/E mode or if the new socioeconomist can generate the needed data left out in the former experiments in a timely manner remains to be seen.

Extensive resources appear to have gone into fruit tree nurseries and vegetable variety trials more closely associated with on-station long-term investigation. While important, it is hoped that a more farmer-oriented, systems research approach will be followed in the future. The Evaluation Team hopes that a pragmatic interaction between the horticulture advisor, the agronomy technician, the irrigation expert, and the socioeconomist will take place so that all may be working on the same homesteads as a team in at least some of the CSR/E recommendation domains.

4. Irrigation: This technical program has been conducted in partial isolation from either the agronomy trials or the horticulture work. The approach has not been pure FSR/E, nor did the former economist or sociologist assist, as might have been expected. Planning is now taking place to remedy these data gaps during next year's trials.

Very valuable information has been gained in the irrigation program, and it is now available for use by the CSR/E Team in each of the recommendation domains where homesteads have access to an irrigation scheme. Numerous reports and hand-outs have been prepared, as well as teaching materials. This technical area has also contributed very positive inputs to the university instructional program.

The Contractor Team irrigation expert has devoted considerable time to the improvement and repair of irrigation schemes, many on the experiment stations, damaged during last year's cyclone. This was not an activity planned in the PP, but it was necessary and there was no alternative. The alteration in activities is normal, and similar disruptions in the plans for contractor personnel are to be expected from time to time. It is not expected that this extra burden will be a constraint to project progress next year.

The Swazi technician trained in the United States to take over the irrigation work has, unfortunately, left the project. It is hoped that a willing Swazi colleague will be appointed in the near future.

5. Rural Sociology: The results of the baseline study and sequential surveys have been compiled and are in use by the project technicians. It was found that the baseline data was not as useful as first expected. It was difficult to use the original findings for site specific research activities or impact measurements. The new socioeconomist understands fully these implications and is working with the production technicians to design

a better data generation format and more specific FSR/E analytical approaches. The Swazi sociologist working with the contractor socioeconomist has asked to be transferred to Mbabane. This means she will not be located at the MRS, and she is being replaced.

6. Agricultural Economics: Several important reviews were published by the economist who formerly filled the position. It is planned that in the future, more site-specific information will be generated and a household or homestead focus will be employed, which should better enable the more production-oriented team members to judge their hypothesis in light of the farmers' own ideas about their identified constraints.

The sociologist and agricultural economist positions have been combined. The work of the socioeconomist and a more holistic approach to farm management and production at the family level is expected to contribute greatly to CSR/E Project outputs in the near future.

7. Extension Training: Results achieved in extension training have been positive during the first 2.5 years of the project. Strong leadership from the ATO, the Penn State advisor, and the CSR/E Team resulted in the design, implementation, and evaluation of training in FSR, including on-farm trials for RAs, EOs, SEOs, and PCVs in four RDAs.

About 80 percent of all extension personnel received training during 1984 in technical subject matter, extension methods, communications, and other subjects. Extension supervisors received training in supervision and management. In general, extension training has been supportive of FSR.

As the project program changes in the years ahead, expanded training in FSR/E for extension personnel will be needed to support a national FSR/E program. Extension personnel will need to be trained in FSR/E methodology and, especially, in specific methodology for validation and transfer activities on site-specific locations. Both training and actual on-site work must be done with a multi-disciplinarian team approach. Joint planning with research, extension, project, and other advisory personnel is needed to develop both short- and long-term FSR/E training and work plans. Training should support FSR/E field work and on-farm trials.

Members of the Extension Training Unit, key national and district SMSs, SEOs, and RDA PMs need to be trained in FSR/E methodology. A district FSR/E SMS to organize and coordinate FSR/E activities could assist in the institutionalization process of the project. Also, a district level extension training position may be needed.

The current number of extension staff at national and RDA levels appears to be sufficient in numbers and quality to significantly contribute in a multi-disciplinary effort toward a national FSR/E program. Training in FSR/E methodology must be provided to all levels of extension personnel, including key decision makers. The assignment of a district extension SMS to organize and coordinate FSR/E activities with research, RDA project management, and extension would strengthen FSR/E activities and should be considered.

8. Agricultural Information: Progress was limited during the first 2 years of the project, partially due to the lack of direction from the Penn

State advisor. A major operation and period of recuperation restricted his involvement and training of the Swazi members of the unit. The new Penn State advisor, who arrived 6 months ago, has quickly moved into establishing very good collaborative working relationships with the information staff.

During the next 3 months, about 14 technical subject matter fact sheets will be produced and distributed to extension workers and researchers. The fact sheets will be distributed through the MOAC newsletter developed by the AIS. A three-ring binder is being developed for the fact sheets. The development of the monthly MOAC newsletter is viewed as a positive means of communicating both FSR on-farm trials and general agricultural information. A total of 350 copies of the annual Research Report will soon be published and distributed

The Agricultural Information Service and the Extension Training Unit have 16 positions. Three are now vacant. One Swazi, who will assume leadership as the AIO, is on long-term participant training in the United States. On-the-job training and short-term training, both in-country and external, are being planned and incorporated into training plans. Joint work plans are being developed.

The AIS has the capability of publishing farming system research through both written and mass media form (radio and newspaper). It is anticipated that as more research results become available, suitable formats for diffusing this knowledge, especially through extension, will be developed.

Research and extension linkages are being developed through the establishment of an Educational Materials Committee. Representatives from research and extension will prioritize agricultural information needs to support FSR/E activities. A systematic procedure for establishing research publication priorities, designated format, identification of writers, standardizing a review process, and distribution procedures will be the major responsibilities of the committee. Of foremost importance will be information and suitable format for both extension worker and homesteader needs.

I. Assess MOAC capacity to provide livestock research and extension; the links to the cropping systems research; and make recommendations on whether or not an expanded livestock research and extension program should be considered.

The Design Team, during the preparation of the PP, included the following statements on the livestock systems that are found in the homesteads on the SNL: "The concept of a systems research approach demands that the entire farming system must be studied and not just a subsystem such as cropping or livestock. The surveys and research trials conducted during the project, which emphasize crop production, will certainly focus on the interrelationships between the crop and livestock subsystems. All recommendations emanating from the research program will be sensitive to the effects that specific changes in cropping practices will have on the total farm system. Consultancies in livestock management have been included in the project to assist the technical assistance team better understand the role of livestock within the SNL farming context." The Design Team went on

to say that interactions in the farming system are also influenced by communal decisions which affect individual livestock management decisions and practices, and these must also be taken into account in terms of the impact on the total farming system.

The Evaluation Team still believes that the PP presented a valid approach for the first few years of the project, but the team also believes, and has recommended, that the project take a full FSR/E approach to research and extension and that livestock must get more attention. This means that livestock should be considered when they impact upon the total system to such an extent that improvements cannot be made in one subsystem without affecting the other. As a first step in this new direction, the team urges the GOS and USAID, at minimum, to consider sending several livestock-oriented technicians for long-term training in farming systems research and extension techniques. (ILCA offers a 4-month FSR/livestock course.) A livestock person trained in the FSR/E approach possibly should be considered for the Contractor Team. If there is a follow-on to this project, then livestock should become a key element in research and extension.

At the present time, the basic human resources available to the project are not adequate in the host-country agencies, and were not contemplated in the long-term TA assignments by the USAID contractor, to initiate a full-fledged livestock systems program. Some livestock extension is being done at present, and several grazing schemes are under study in various locations in the country. Interest has been shown by other donors in the operation of a

forage quality laboratory. USAID is considering the use of funds not used in the construction of the project library to assist this effort.

J. Assess the flow of information into and out of the research system; is the project in touch with world literature; is this getting into the hands of the farmers as well as national decision makers.

The Malkerns Research Station possesses adequate library facilities for the project, but the services are at a low level. A number of international journals are available as well as the Agriss Agricultural series. No trained person is in charge of selected world source information flows into or out of the CSR/E Project. No type of formal information selection or dissemination system has been developed for CSR/E staff support, or for other researchers working in Swaziland. The Evaluation Team could find no technician profiles of information needs that were being used to request regular periodic information searches from either USAID sources or international information retrieval services.

Individual scientists on the project use their own sources for information searches and subscribe to professional journals in their speciality fields. The Evaluation Team feels the project has not suffered significantly from lack of new information, but the personnel should try to develop a formal system for research needs during the remainder of the project. It is suggested that "reinventing the wheel" be avoided and that one of the standard systems be utilized. This task should be given to the Agricultural Information Specialist assigned to the project.

The MOAC library, on the other hand, is inoperative. The acquisitions currently in the library will need to be cataloged when the new Extension Training Unit and Agricultural Information Service facilities are completed. The MOAC library is viewed as an important repository of extension, training, sociology, and agricultural information. Key research information needs to become a part of the resources of the library to assist in accessing FSR/E information to national decision makers and field staff.

With the advent of the newsletter published by the AIS, the Evaluation Team believes that some research results are getting to MOAC people. Research results developed by the CSR/E Team are being prepared into extension hand-outs and research reports. The team feels that more AIS efforts directly related to project developed information should take place during the remainder of the project.

The use of the project as a formal link in international networking information activities has not as yet matured as planned in the PP.

K. Findings relating to the effectiveness and appropriateness of the project's training programs and guidelines for improving project training activities.

Findings and recommendations have been presented throughout the report, and especially in the log frame analysis (Part VI). Since training is such an important part in the institutionalization of CSR/E, it is discussed here in some detail. The topics are: Organization of training, MOAC training list, long-range training plan, FSR/E training, external FSR/E training,

long-term academic training, short-term training, pre-service training, and cross-cultural orientation for Penn State advisors. Many of the recommendations are consistent with those made in the March 1984 Rural Development Strategies Seminar.

1. Organization of Training: It must be recognized that the Extension Training Unit is the major MOAC vehicle for staff development. It is currently staffed by the ATO, assistant training officer (AATO), and the Penn State advisor. The unit does not have a secretary or typist who can devote full time to training activities, and this restricts the effectiveness of the unit. Many of the expectations of the MOAC for the Extension Training Unit go beyond developing training programs relating to CSR/E activities. These activities include scheduling seminars and conferences for various divisions, participating in training activities of other organizations, and scheduling external long- and short-term training for 50 to 60 MOAC candidates a year. About 70 percent of these candidates will not be working in activities directly related to FSR/E. One needs to take the broad view of auxillary training relating indirectly, but still supporting FSR/E and other essential MOAC training over the long run. Although a considerable amount of time of all three members of the Extension Training Unit is diverted away from training directly related to FSR/E, they are essential MOAC activities.

2. MOAC Training List: The ATO, AATO, and the Penn State advisor report that they spend as much as 40 to 50 percent of their time handling the details and procedures of the MOAC Training List. There are some 30 steps to complete for each candidate to get clearance before leaving the

country. The Extension Training Unit is expected to handle this major task. A number of the candidates for external training are from the project, so a percentage of the unit's efforts are directly related to the project.

It is clear from the Minister of Agriculture and Cooperatives on down, that the Training List is considered a major and high priority activity for the unit. Members of the Evaluation Team learned that the members of the Extension Training Unit also regard it as within their proper domain in the MOAC. It, therefore, appears to be an appropriate activity of the unit; however, it currently restricts and limits the amount of time the unit can devote to designing, implementing, and evaluating training directly related to the project, or any other training.

A number of actions can be taken to improve the effectiveness of the unit in handling the Ministry-wide Training List. The Extension Training Unit is putting a high priority on training the new AATO to take over major responsibility for preparing the Training List. The new AATO has been on the job only for a month, and it will take at least a year for him to be able to handle 80 to 90 percent of the work. (This may be a conservative estimate.)

Members of the Extension Training Unit strongly recommend that the GOS request the services of a qualified PCV to work for 2 years with members of the Extension Training Unit to develop procedures and techniques to streamline the system and assist in training the AATO. The Evaluation Team supports the recommendation.

Qualifications for the PCV should include: (a) Staff development or manpower training experience, (b) computer skills, (c) training program design and evaluation, and (d) management training relating to operations and procedural development. A detailed job description should be developed for the PCV position as well as the ATO and AATO positions. A computer training record system or pack for each candidate should be developed as well as hard copy data for the individual personnel file. A flow chart plotting the progress of each candidate through the various steps should be developed. Joint work plans should also be developed in the unit.

3. Long-Range Training Plan: The MOAC has requested the Extension Training Unit to develop a long-range training plan for the Ministry. There is great concern from MOAC leadership that many candidates that are sent abroad, especially for short-term training, are not placed back in positions where they can apply their new skills. The Evaluation Team agrees that the development of a long-range training plan, which identifies candidates, location, and type of training, post to be assumed upon return, and specifically details how the training will be applied on-the-job and benefit Swazi agriculture, should be a high priority. The project training plan should be integrated into the MOAC long-range training plan.

4. FSR/E Training: Of great importance in accelerating FSR/E is training for researchers, extension workers, and key MOAC managers. This is partially based on the GOS intent to make FSR/E the primary research and extension mode for the future in Swaziland. Training can act as an accelerator in speeding up the process of gaining skills, knowledge, and

attitudes and their application to FSR/E projects. The training also takes place in an multi-disciplinary setting, and this is very desirable.

It is important that a common FSR/E methodology be agreed upon for the country and the relevant training planned, developed, and implemented to support the national effort. A number of in-country FSR training sessions have been held for ROs, PCVs, RAs, RDA officers, extension workers at various levels, and the Penn State Team. The Evaluation Team recommends that in order to accelerate the FSR/E emphasis, FSR/E training must be expanded and include key individuals from both research and extension.

The Extension Training Unit personnel view their unit as having a key role in designing and coordinating major FSR/E training. It is imperative that members of this unit, key SEOs, EOs, and RDA PMs on RDAs and areas conducting on-farm trials need to be trained in FSR/E, along with ROs and other agricultural workers. If the position of district FSR/E specialist is established, then these individuals should be included in training. FSR training modules (slide-tape) should be developed to support this training.

Training should be jointly planned and included in work plans developed by GOS research, GOS extension, and Penn State personnel in order to organize the endeavor in a systematic manner. The Extension Training Unit should play a key role in this effort.

It is crucial to bring in the experience and personnel of organizations such as CIMMYT or similar IARCs in FSR/E to provide assistance in developing the FSR/E methodology appropriate for Swaziland. Planning, training, and

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technical assistance are part of the help that an organization such as CIMMYT can provide. Their inclusion in developing a jointly-planned, comprehensive approach and supporting strategies should be carried out in the near future.

5. External FSR/E Training: Swazis studying abroad as long-term participants are in traditional U.S. academic programs. Most of these programs are commodity or discipline oriented. The Evaluation Team is very concerned that long-term participants have not participated in FSR/E training during their U.S. program. The Evaluation Team strongly recommends that long-term Swazi participants receive FSR/E orientation and training during their U.S. experience. Training can be arranged through a number of universities including Colorado and Kansas State Universities and the University of Florida.

External training opportunities for short-term participants in FSR/E should be actively pursued for Swazi FSR/E personnel. Training is available from ILCA, CIMMYT, and other IARCs. The costs are often borne by the sponsoring institution. Project funds can also be utilized.

The majority of the Penn State Team had little exposure to FSR/E prior to their arrival in Swaziland. The Evaluation Team recommends that all Penn State advisors go through an FSR/E course prior to their departure for Swaziland. They should also participate in in-country FSR/E training.

The project should purchase the FSR/E slide-tape modules produced by the University of Florida. The modules can be utilized at Penn State and in

Swaziland for FSR/E training. Several similar modules adopted to Swazi conditions can be developed by research and extension workers in cooperation with the AIS. A copy of Farming Systems Research and Development: Guidelines for Developing Countries, by Shaner, Philipp, and Schmehl (Westview Press, 1981; USAID Contract No. AID/DSAN-C-0054) should be provided to every FSR/E contract or Swazi project team member.

6. Long-Term Academic Training: The PP called for 54 study years of academic training. To date, 15 individuals either have been trained and returned to Swaziland or are currently in training. The project appears to be on schedule in terms of long-term training, and the type of academic training appears to be appropriate for the participants except that the training should be supplemented by additional FSR/E training.

Of the four candidates who have returned, there are three who have not been effectively reintegrated into the project. The irrigation researcher took a job in private industry. The sociologist requested a transfer to a post in Mbabane and this took her away from the post at Malkerns. Another participant who returned in August 1984 has not been paid his monthly salary. It is of major concern to the Evaluation Team that returning participants are not being retained in the project. As has been noted elsewhere, this severely limits the institutionalization process of the project. The MOAC is encouraged to develop policies and procedures to maintain returning long-term participants in the project.

7. Short-Term Training: A total of 4.75 years of short-term training was planned in the PP. To date, only .4 years have been utilized in the

project. The Evaluation Team views the short-term training phase of the project as far behind schedule.

The contract states that the GOS must identify individuals to receive short-term training and pay the costs of round-trip transportation. In the collaborative mode, efforts should be made to jointly identify short-term candidates for training. In addition, key MOAC decision makers need to know how the training will be utilized upon the return of the participant and the anticipated benefit to the country. This type of information should be developed in making short-term training requests. Short-term participant training should also be incorporated into the long-range training plan. Constraints, whether they be transportation cost, procedural problems, etc., should be identified, and solutions reached through the collaborative mode.

Further emphasis on short-term training in Africa should be explored. Costs are often borne by the sponsoring institution.

8. Pre-service: The majority of newly employed extension workers are certificate graduates from the University of Swaziland. This course is sponsored and run by the MOAC. The course is taught by MOAC and UNISWA personnel. The incorporation of FSR/E methodology into the certificate-level curriculum should be studied by the MOAC and the Penn State Team. FSR/E methodology can also be incorporated into fieldwork of the certificate program. The training of future frontline extension workers in FSR/E methodology will greatly assist the future development of this effort.

Future RAs may come from the diploma level graduates, and ROs from the B.Sc. graduates. Familiarization with FSR concepts and methodology would be useful to these students prior to graduation.

9. Cross-Cultural Orientation: Orientation for the USAID Contractor Team probably could be improved. New Penn State advisors to the project should continue to attend the week-long orientation program sponsored by USAID in Washington, D.C., and cross-cultural orientation should be stressed before departure and continued upon arrival in Swaziland. The advisors and family should be included in the orientation program. Some of the Peace Corps materials and contacts for training PCVs would be useful. The process of additional study on such topics as development, institutionalization, etc. are encouraged. The orientation guidelines suggested by BIFAD should be met, and hopefully exceeded.

L. Assess the effectiveness of support for and the participation of Peace Corps Volunteers in the project.

Findings and recommendations regarding support and participation of PCVs is noted throughout the report but especially in the log frame analysis. Further discussion is outlined here.

As noted earlier, four PCVs were requested by GOS for the project and four well-trained PCVs with degrees in agronomy and horticulture were recruited and have been working with the project. Three of the field based PCVs have access to motorcycles for transportation, and there is a pickup for fieldwork in the Central RDA.

The building of the houses for PCVs in the districts and for RAs working on the on-farm trials is considerably behind schedule. To date, four houses have passed inspection. A fifth house is almost ready for inspection and the remaining nine houses have not been built or are in various stages of construction. It is crucial to the success of the project via support for RAs in the RDAs to complete the construction of houses as soon as possible. In general, the Evaluation Team members are not critical of the level of support for the PCVs from the project, but it could have been better.

The original design of the project called for the PCVs to act as extenders and coordinators of field trials early in the project. Four PCVs were requested for the first 2 years of the project to work directly with RAs on on-farm trials. Several delays affected this part of the project. The MOAC was delayed in securing 10 RAs for the initial phase of the project, and qualified PCVs did not become involved in the project until well into the first year of on-farm trials.

The PCVs work under the supervision of the Swazi Chief RO and it is apparent he has delegated much responsibility to the agronomist provided by Penn State. The agronomy RO is now in the United States on long-term participant study so the Penn State agronomist is, in effect, "in charge" of the on-farm dryland trials. All members of the on-farm trial team are directly responsible to the Chief RO at Malkerns. The Evaluation Team feels that this line of authority is a logical one.

The PCVs have received some FSR training from the Penn State agronomist. The PCVs working with on-farm trials in four RDAs are responsible for

designing, implementing, and monitoring on-farm trials in their geographic areas of responsibility. Each PCV coordinates site-specific trials with the RDA PMs, SEOs, EWs, and RAs. EOs and workers assist in identifying potential homesteaders for the trials.

Training in FSR, including on-farm trials, has been conducted for PCVs, RAs, EOs, and frontline EWs during three week-long sessions in 1984. The training has increased the amount of extension cooperation at the RDA and field level. A key to improved research-extension linkages is a continuation of training of this type, and an increased effort to involve extension in the early stages of FSR--at both RDA and site specific locations.

The role the PCVs are playing at present is a difficult one. This is especially true in terms of their relations with the RAs. In many cases, the RAs perceive they are being directly supervised by an expatriate, and several of the PCVs said their work could be being done by a Swazi. There is a fine line between coordinating the activities of the RAs and appearing to be the direct supervisors of the RAs. The Evaluation Team believes that conflict is inevitable if the PCVs (expatriates) directly supervise the RAs. An alternative is the designation of a district SMS to be responsible for organizing and carrying out on-farm trials in the district. The problem with the first proposal is that the GOS may not create any new posts in the near future. The second proposal poses the problem of extension personnel at the district level supervising RAs who are administratively under the Department of Planning and Research. The important point is that as FSR, including on-farm trials, is institutionalized, it is essential for the PCV

role as a coordinator to eventually pass to a Swazi. This individual should have FSR/E training and be in charge of coordinating and directing FSR/E activities at the district level. This type of Swazi leadership will be increasingly important as on-farm trials extend to all of the nine RDAs in Phase III of the National Rural Development Plan.

PCV involvement will probably be essential in some type of coordinating role for at least another cropping season. In light of the fact PCVs told the Evaluation Team that most of the responsibilities they are now performing could be handled by a Swazi with some additional training, the GOS should identify and assign key individuals within the MOAC at the district level to work with the FSR Team in a transition period to take over the responsibilities of the PCV as soon as possible. Once an assignment is made, joint work plans should be developed with the FSR national and RDA teams to insure a smooth transition. This will assist in the process of institutionalizing FSR/E. Work plans should also include input from PMs, SEOs, EOs, and EWs.