App 12A-1, Chp 12, HB 3
(TM 3:43) 9-30-82

CLASSIFICATION

# PROJECT EVALUATION SUMMARY (PES) — PART I

Report Symbol U-447

| 1. PROJECT TITLE | 2. PROJECT NUMBER | 3. MISSION/AID/W OFFICE |
|---|---|---|
| Agricultural Research Project | 612-0202 | USAID/Malawi |

4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY)

☐ REGULAR EVALUATION ☐ SPECIAL EVALUATION

| 5. KEY PROJECT IMPLEMENTATION DATES | 6. ESTIMATED PROJECT FUNDING | 7. PERIOD COVERED BY EVALUATION |
|---|---|---|
| A. First PRO-AG or Equivalent FY 79 | A. Total $10,403,700 | From (month/yr.) August 1979 |
| B. Final Obligation Expected FY 82 | B. U.S. $ 9,000,000 | To (month/yr.) February 1983 |
| C. Final Input Delivery FY 85 | | Date of Evaluation Review |

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

| A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.) | B. NAME OF OFFICER RESPONSIBLE FOR ACTION | C. DATE ACTION TO BE COMPLETED |
|---|---|---|
| 1. Budget reporting formats for each financial management entity should be reconciled. | UF, USAID, DAR and RFMC | June 1983 |
| 2. Review needed of the rationale behind the current disciplinary mix in participant training to reassess the designation of the remaining positions. | DAR, UF & USAID | May 1983 |
| 3. In follow-on project, technical assistance should be planned to maximize the investment in participant training under the present project. | DAR, USAID | September 1983 |
| 4. The funding gap should be closed to assure that all 33 participants be trained under the project. | UF, USAID | July 1983 |
| 5. Recommend that academic qualifications in the targeted disciplines outlined in the PP continue to be the primary criterion upon which training participants are selected. | UF, DAR | July 1983 |
| 6. Recommend the institution of formal candidate selection criteria and selection process. | DAR | May 1983 |
| 7. OPC should have an opportunity to monitor the progress of trainees funded under the project; USAID should ensure that OPC's files are updated and that all future progress reports are copied to the Training Office and to CARO. | USAID | June 1983 |

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

- ☐ Project Paper
- ☐ Financial Plan
- ☐ Logical Framework
- ☐ Project Agreement
- ☒ Implementation Plan e.g., CPI Network
- ☐ PIO/T
- ☐ PIO/C
- ☐ PIO/P
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

- A. ☐ Continue Project Without Change
- B. ☐ Change Project Design and/or
- ☒ Change Implementation Plan
- C. ☐ Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)

Mr. Murl Baker - AID/W/AFR/PD/EAP, Team Leader
Dr. Curtis Nissly, REDSO/ESA, Agronomist
Dr. Dan Galt, University of California, Ag. Economist
Ms. Joan Atherton, AID/W/PPC/PDRP/RD, Anthropologist
Dr. Henry Mwandemere, MOA/DAR, Acting CARO, Soils Scient.
Mr. Frank Mwambaghi, MOA/Division of Planning, Economist

12. Mission/AID/W Office Director Approval

Signature: Sheldon W. Cole

Typed Name: Sheldon W. Cole

Date:

AID 1330-15 (3-78)

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| 8. | USAID should encourage and assist the DAR to develop a longterm manpower development plan so that training needs and opportunities can be more closely coordinated. | USAID, DAR | Sept. 1983 |
| 9. | Training sites for participants should continue to be diverse. | UF, USAID | July, 1983 |
| 10. | Recommended that in order to assess the utility of in-service training courses, UF should survey the participants approximately one year after the date of the course. | UF | Dec. 1983 |
| 11. | Recommend that future in-service courses have an immediate participant evaluation to alert the technical assistance staff to the strengths and weaknesses of such training. | UF | April 1983 |
| 12. | Regarding participation in professional meetings, conferences, etc., recommend that CARO be asked to take a more active role in participant nominations to assure that the benefits of this funding are equitably distributed. | CARO | May, 1983 |
| 13. | On-the-job training should be empahsized and carried over to the follow-on project. | UF | May, 1983 |
| 14. | Individual technical assistance team members have tended to specialize on particular crops and advise on several research disciplines with that particular commodity program, and it is recommended that an interdisciplinary team approach be revived and made operational. | UF | June, 1983 |
| 15. | In future recruitment for technical assistance team members, an important requirement should be long term experience in research in developing countries, particularly Africa. | International Programs, UF | May, 1983 |
| 16. | Team members should draft up detailed work plans shortly after arrival in-country and have such work plans reviewed and approved by the UF team leader, USAID/Malawi and CARO. | UF, USAID and CARO | June, 1983 |
| 17. | Propose that the UF post two horticultural specialists for the duration of the project. | UF, Inter. Pro. | July, 1983 |
| 18. | Recommend that fewer numbers of short-term consultants be called upon, that those arriving in-country stay for longer period of time and that key types of technical expertise return periodically. | UF | May, 1983 |
| 19. | Recommend that procurement and delivery of commodity procurement be expedited. | UF | June, 1983 |
| 20. | Recommend that if the soils laboratories and the | UF, USAID | Aug. 1983 |

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| | forage and feeds laboratory are not functional before September 1983, that the technical assistance component of the project be extended by a year to insure that Malawians are fully capable of operating and maintaining the equipment. | | |
| 21. | Recommend that the DAR and UF monitor the costs involved in servicing, operating and maintaining any new equipment being introduced by the project and estimate the financial implications of using such equipment and that follow-up project consider assisting the DAR in covering recurrent costs. | UF, DAR | June, 1983 |
| 22. | In the procurement process, USAID/Malawi should show the amount to be reimbursed in both dollar and Kwacha amounts. | USAID | May, 1983 |
| 23. | The system for reimbursing the GOM should be refined to encourage the Government to allocate a greater part of its overall budget to agricultural research. | USAID | June, 1983 |
| 24. | Recommend that UF backstop team facilitate the importation of books and other materials needed by in-country team. | Int. Prog. UF | April,1983 |
| 25. | Recommend that all team members and their Malawian staffs visit international centers such as IITA and ICRISAT. | UF, MOA | June, 1983 |
| 26. | Recommend that the economics section take the lead in conducting a workshop to introduce economic trial analysis to research agronomists. | UF | June, 1983 |
| 27. | Recommend that the economics section place less emphasis on macroeconomic policy issues. | UF | June, 1983 |
| 28. | Recommend that the economics section spend more time in farmlevel trial design and collaborating in adaptive research with the farming systems section. | UF | July, 1983 |
| 29. | Recommend that the UF team meet and sort out the group feeling towards farming systems research in general and the specific place FSR has in each researcher's program. | UF | July, 1983 |
| 30. | The UF team should meet with CARO to reconcile any differences between perspectives and views of FSR in Malawi. | UF, CARO | July, 1983 |
| 31. | Recommend that the agronomist be assigned as the FSR advisor. | UF | March,1983 |
| 32. | Suggest that, in view of the importance of maize to Malawi, the size of the maize breeding section | UF, DAR | July, 1983 |

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| | be expanded. | | |
| 33. | Recommend that maize and other crop trials be used more as a training device. | UF,DAR | Nov. 1983 |
| 34. | Recommend that on-farm trials with maize on agronomic problems be initiated with the FSR section. | UF, DAR | Nov. 1983 |
| 35. | Recommend that fact sharing trips to the IRC's and neighboring countries be continued in order to review the national breeding programs. | UF, DAR, USAID | June, 1983 |
| 36. | Regarding the forage agronomy program, little efforts made to identify problems and constraints of the smallholder dairy farmer or beef stall feeder, and greater emphasis should be given to working with livestock extension personnel. | UF, DAR | June, 1983 |
| 37. | Recommend that the livestock section participate in conjuction with the FSR and economics section to design and implement appropriate on-farm trials in pasture establishment and maintenance. | UF, DAR | June, 1983 |
| 38. | Recommend that the horticulturalist position be filled immediately. | Int. Pro., UF | April,1983 |
| 39. | Recommend that the UF/USAID project management investigate the feasibility of possible allocation of some project funds to qualified and interested scientists at Bunda Collage for research. | UF, Bunda and DAR | Sept. 1983 |
| 40. | Recommend that both informal and formal professional linkages between DAR and Bunda staff be strengthened and encouraged. | DAR & BUNDA | June, 1983 |
| 41. | Recommend that soils section, UF and USAID determine the needed TA and training input to get the new soils laboratories in full operation as soon as feasible. | UF, USAID | July, 1983 |
| 42. | Need for research priorities to be clearly established between DAR and the veterinary Department regarding long-term nature of livestock research. | DAR, Vet. Dept. | July, 1983 |
| 43. | Commencement as soon as possible of research programs on small ruminants, poultry and swine with the collaboration of Bunda and the project. | UF, Bunda | July, 1983 |
| 44. | Animal research has been too "station-bound" and focused on much larger beef and dairy herds which smallholders cannot manage. | UF, DAR | July,1983 |

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| 45. | If additional staff cannot be found for animal research, serious consideration should be given to postponing some of the planned training. | UF, DAR | July, 1983 |
| 46. | Long-term planning for livestock research is imperative. | UF, DAR | June, 1983 |
| 47. | Recommend closer coordination between the FS section and the economics section and the commodity programs. | UF, DAR | June, 1983 |
| 48. | Recommend that research recommendations be drafted jointly by several sections of the project. | UF | Sept. 1983 |
| 49. | Agreement is needed concerning the fundermental objective of the project as well as clear assignment of responsibilities. | UF, DAR, USAID | Sept. 1983 |
| 50. | The financial management system for the project does not permit the UF, USAID and the DAR to jointly and periodically meet and plan future actions. | UF, USAID DAR | June, 1983 |
| 51. | The project lacks flexibility to make adjustments which are necessary in the course of project direction and limited opportunities for joint planning and budgeting. | UF, USAID, DAR | June, 1983 |
| 52. | Consensus needs to be reached on the types of technical assistance (both long and short term) needed for the duration of the project. | UF, USAID | July, 1983 |
| 53. | Recommend that a great deal more attention be given in the design of future AID projects in Malawi and that appropriate project management systems are developed which will provide better project direction and improved project performance. | USAID | Sept. 1983 |
| 54. | Need for agreement among the GOM, UF, and USAID on priorities to production of research results institutional strengthening and the provision of commodities, physical facilities and services. | DAR, UF USAID | July, 1983 |
| 55. | Recommend that USAID and UF prepare an up-to-date financial status report of available project resources to determine an acceptable format for future financial reports. | UF, USAID | May, 1983 |
| 56. | Recommend that after the budget is cleared, that USAID, UF and the DAR meet and determine what technical assistance is needed for the duration of the project, what training should be initiated, what commodities should be procured and whether existing project funds are adequate or additional | UF, USAID DAR | July, 1983 |

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|---|---|---|---|
| 57. | Recommend that USAID, UF and the DAR develop a financial management plan for the duration of the project and that the concerned parties periodically exchange information on the draw down of project funds and discuss any adjustments in budgets that may be required. | UF, USAID DAR | July, 1983 |
| 58. | Recommend that USAID/Malawi and the GOM jointly determine the best project management system on any follow-on project. | USADI, DAR | Sept.,1983 |
| 59. | Recommend that an administrative assistant be hired for the COP. | UF, DAR, USAID | June, 1983 |
| 60. | Recommend that the UF, USADI/Malawi and CARO review the internal division of responsibilities held by the UF team members to insure that the most knowledgeable are advising Malawian researchers, that there is interdisciplinary coordination, and that the team is provided adequate direction and coordination by the COP. | UF, USAID, DAR | June, 1983 |
| 61. | Recommend that UF and DAR reach agreement on the role of, and direction, adaptive on-farm research conducted at the ADD level for at least the duration of this project, and ideally, beyond. | UF, DAR | July, 1983 |
| 62. | Recommend that the research priorities which have been defined for the major research programs supported by this project be considered as provisional in nature until such time as national research priorities are clearly established and section or program priorities are reviewed in conjuction with national research priorities. | UF, DAR | July, 1983 |
| 63. | Recommend that any reassessment of priorities or objectives which have been defined for major research programs supported by the project be done in a manner which will give greater importance to the identified constraints faced by Malawian smallholders. | UF, DAR | June, 1983 |
| 64. | Recommend that the DAR continue to pursue the establishment of national research priorities in conjuction with the proposed restructuring of the DAR. | DAR | July, 1983 |
| 65. | Recommend that USAID and MOA consider a follow-on project to the present research project which focuses on developing the adaptive research units and extension units which will form critical components of a system along with evaluation for the dissemination of information and services to smallholders as well as continuing to strenthen appropriate component research. | USAID, MOA | Sept. 1983 |
| 66. | Recommend that the program commenced by the AID | UF, USAID DAR | July, 1983 |

supported Women in Development Project be intergrated into and supported by the on-going Agricultural Research Project and furthermore, that any follow-on project consider additional support to this effort as an integral part of the DAR's long-term research program.

## 13. Summary

The Malawi Agricultural Research Project was designated by USAID as a five year first phase of a longer term effort for improving agricultural research. Phase one was initiated for the specific purpose of increasing agricultural production and real incomes of smallholders who constitute about 85 percent of the population of the country. Major emphasis was placed on strengthening the capacity of the Department of Agricultural Research (DAR) to provide culturally acceptable and economically sound research for smallholder needs in satisfactory quality and quantity and in a form usable by the Extension Service. Two vital components of this plan involved: (a) addressing the critical shortage of trained research scientists by funding graduate studies for up to 33 Malawians; and, (b) alleviating the lack of physical facilities and equipment through a major construction and procurement effort.

Considerable progress has been made in strengthening the DAR's capability to conduct sound and relevant agricultural research, and the graduate-level training component will further enhance the quality of research needed for the future. The project goal and purpose appear to be achievable but owing to numerous delays and administrative problems these may not be realized until well after the PACD.

Major problems include:

1. Protracted negotiations over the contract and a six month delay in actual implementation of the project.
2. Delays in procurement of equipment and in the construction of physical facilities.
3. Delays in identifying Malawians for graduate studies.
4. Delays in fielding the technical assistance team and failure to provide qualified individuals for the positions designated in the Project Paper.
5. Inadequate budgetary management.
6. Failure to identify research priorities.

## 14. Evaluation Methodology

This evaluation was conducted for the purposes of measuring progress, improving implementation, and for designing follow-on activities.

Evaluation methodology included visits to research stations receiving funding under the project; interviews with officials at all levels in the Ministry of Agriculture, University of Florida team members and USAID/Malawi; and, review of data and documents developed by the technical assistance team and the DAR. A six member evaluation team was fielded representing the GOM, AID/Washington, REDSO, and in the area of economics, the University of California. The cost of the evaluation was about $45,000.

15. External Factors

A major factor which will have an impact on the project is the reorganization of the DAR which is due for implementation in late 1983. The completed reorganization plan has not yet been released by the Ministry of Agriculture thus further discussion is not possible at this time.

16. Inputs

A number of input problems have been encountered in implementing this project, including, delays in procurement, construction, contractual arrangements for the provision of technical assistance, and identification of candidates for graduate training. Further, there has been inadequate support of research by the GOM, specifically in the assignment of research and support personnel to the project.

17. Outputs

One major output target is unsatisfactory, e.g., the results of the research being conducted by the project are not getting to the Extension Service and in turn to the smallholder. A major effort needs to be made to develop links between research and extension.

18. Purpose

This project's purpose is stated as being "to strengthen the capability of the DAR within the MOA to provide socially acceptable and economically sound research for smallholder needs in satisfactory quality and quantity and in a form usable by the extension services." Progress has been made toward the project's basic purpose and goals but owning to delays already enumerated elsewhere in this report, these may be realized until well after the PACD.

19. Goal/Subgoal

The project goal, as stated in the Project Paper, "is to increase agricultural production and real incomes of smallholders." See number 18.

20. Beneficiaries

The ultimate and primary beneficiaries of this project are smallholders who constitute 85 percent of the population of Malawi. Initial beneficiaries of the project are Malawians involved in agricultural research including those in various positions with the MOA, those receiving in-service and hands-on training at research stations, and those being funded for graduate studies in the United States. All Malawians will benefit from the project goal of increasing small-farm, labor-intensive agricultural productivity.

21. Unplanned Effects

Not pertinent at this time.

22. Lessons Learned

Significant disparities of expectations among USAID, the GOM and the UF technical assistance team were noted in the evaluation report. Each assigned different relative priorities to production of research results, institutional strengthening and the provision of commodities, physical facilities and services. Thus, USAID/Malawi recommends that during project design benchmarks be more closely and carefully emphasized and that the follow-on project not be of such an ambitious nature. A greater impact can be made in agricultural research if priorities are more sharply focused and activities are concentrated in a few areas.

23. Special Comments or Remarks

None at this time.

# EVALUATION REPORT

# FOR

# MALAWI AGRICULTURAL RESEARCH PROJECT
# (612-0202)

FEBRUARY 1983

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# ACRONYMS/ABBREVIATIONS

| | |
|---|---|
| ADD | Agricultural Development District (i.e. KRADD=Karonga ADD MZADD=Mzuzu; KADD=Kasungu; LADD=Lilongwe: SLADD= Salima; LWADD=Liwonde; BLADD=Blantyre; and NADD=Ngabu) |
| ADMARC | Agricultural Development and Marketing Corporation |
| AID/RFMC | AID's Regional Financial Management Center (Nairobi) |
| APM | Assistant Programme Manager |
| ARC | Agricultural Research Committee |
| ARCO | Adaptive Research Coordinator |
| ARS | Agricultural Research Station |
| CAO | Chief Agricultural Officer |
| CARO | Chief Agriculture Research Officer |
| CIMMYT | International Center for Corn and Wheat Improvement (Mexico) |
| COP | Chief of Party (UF) |
| CTO | Chief Technical Officer |
| DAR | Department of Agricultural Research |
| EPA | Extension Project Area (originally, environmental project area) |
| FHA | Farm Home Assistant |
| FSA | Farming Systems Analyst (or analysis section) |
| FSR | Farming Systems Research |
| GOM | Government of Malawi |
| GRE | Graduate Record Examination |
| IBRD | International Bank for Reconstruction and Development (World Bank) |
| ICRISAT | International Crop Research Institute for the Semi-Arid Tropics (India) |
| IITA | International Institute for Tropical Agriculture (Nigeria) |
| ISNAR | International Service for National Agricultural Research |
| MANR | Ministry of Agriculture and Natural Resources |
| MK | Malawi Kwacha = 1.09 0.3. dollars |
| NRDP | National Rural Development Programme (partially funded by IBRD) |
| NSSA | National Sample Survey of Agriculture |
| OIC | Officer in Charge (of a research station) |
| OFT | On-Farm Trial |
| OPC | Office of the President and Cabinet |
| OST | On-station Trial |
| PARO | Principal Agricultural Research Officer |
| PM | Programme Manager |
| PO | Professional Officer |
| PP | Project Paper |
| RDP | Rural Development Project |
| RELC | Research-Extension Liaison Committee |
| RO | Research Officer |
| SEO | Senior Extension Officer |
| TA | Technical Assistance |
| TOEFL | Teaching of English as a Foreign Language |
| TO | Technical Officer |
| UF | University of Florida |
| VRC | Variety Release Committee |
| VRDP | Variety Result Demonstration Plot |
| WIADP | Women in Agriculture-Development-Project |

## I. INTRODUCTION

AID approved a grant of $9 million to the Government of Malawi (GOM) for the Malawi Agricultural Research Project (612-0202) in August, 1979. The project was intended to develop an agricultural research capability which focuses on the needs of Malawi's smallholders and subsistence farmers, who comprise approximately 85 percent of the Malawian population. The project was conceived as a support element for the National Rural Development Program, an ambitious nationwide integrated rural development activity designed to improve conditions for Malawi's rural population.

The project was designed using AID's "collaborative assistance" mode which permits a university (Title XII institution to be competitively selected to complete the final design of the project and promptly commence its implementation when the project is approved for funding by AID. Although approved for funding in August, 1979, the University of Florida contract for project implementation was not signed until May, 1980. The implementation of the project started mid year 1980 and thus the project has been operational. for about 2 and one and half years. This project was among the first group of projects to be designed and implemented subsequent to the October 1979 authorization of the establishment of an A.I.D. Office in Malawi.

The project was designed as the first phase, with a duration of about five years, of a longer term effort for improving agricultural research in Malawi. Additional phases of the program were specifically identified in the Project Paper; however, a mid-term evaluation of the project was anticipated which would assess the progress made to date and would investigate possible types of follow-on assistance that might be required. Accordingly, this was a part of the mandate of evaluation.

The evaluation was conducted by a team composed of the following individuals:

Ms. Joan Atherton, AID/W/PPC/PDPR/RD, Anthropologist;
Dr. Curtis Nissly, REDSO/ESA, Agronomist;
Dr. Daniel Galt, University of California, Agricultural Economist;
Mr. Frank Mwambaghi, MOA/Division of Planning, Economist;
Dr. Henry Mwandemere, MOA/DAR, Acting CARO, and Soils scientist;
Mr. Murl Baker, AID/W/AFR/PD/EAP, Team Leader.

It should be noted that the participation of the Malawian team members was intermittent, due, in part, to inadequate internal organization of the evaluation team and partly to the press of other resposibilities. We would hope that in the future, better planning for such evaluations will permit fuller joint participation.

The evaluation team visited the Ngabu ADD and research station, Kasinthula, Makoka and Bvumbwe research stations in the Southern Region of Malawi, Chitala and Chitedze Research Stations and Bunda College in the Central Region, and Lunyangwa (Mzuzu) station in the Northern Region. Gasoline

shortages prevented the team from a wider range of on-site inspections (i.e. Mbawa Station, Baka/Meru Stations and the Limphasa Substation), but it is felt that an adequate sample of facilities and activities was obtained within the limitations imposed by the shortages. Seven of the 11 major ARS, were visited, albeit briefly, during the course of this evaluation.

Interviews were conducted with professional staff of the DAR, including the UF team members. Meetings were held with the Deputy Secretary, MOA, some Department of Agricultural Development staff at both headquarters and ADD levels and staff of the OPC. Documentation relating to the project and to the work of the DAR, especially the outputs of the technical assistance staff, were reviewed.

Issues were raised and discussed with relevant personnel as the evaluation proceeded. A final debriefing with USAID and GOM personnel was held, and comments rendered were considered in the preparation of this report. Major Action Decisions have been reviewed by the USAID Representative and the Acting CARO.

Each member of the evaluation team prepared a portion of the evaluation report. The authors of the individual sections drew conclusions and made suggestions for each of the sections evaluated. These comments are largely the recommendations of an individual evaluator with the concurrence of the other team members concerning the specific section of the project being reviewed, and in this report are labeled as "suggestions". The main conclusions and recommendations section of the report represents the major recommendations which treat the project as a whole rather than a specific component and represent the team's viewpoint rather than any single individual.

As a discrete part of this evaluation, Ms. Atherton evaluated the PPC-funded Women in Agricultural Development Project (WIADP) which has close linkages with the agricultural research project and may have served as a pilot activity for future women in development activities by the DAR and DAD with AID support. The WIADP evaluation report is attached as Appendix 1 to this evaluation report.

The evaluation team wishes to express its gratitude for the assistance, patience, and hospitality offered throughout the duration of this evaluation by the staffs of the DAR, USAID, the University of Florida, Bunda College and several other individuals and organizations visited during the evaluation. A special thanks is given to Mr. R. Manda of the DAR headquarters for assistance provided in fixing the team's itinerary and setting up various appointments.

Lastly, the team as a whole, wishes to commend the University of Florida team for the exceptionally fine job which they did to prepare several major reports and documents summarizing numerous activities and accomplishments of the project. The advance preparation by the University of Florida team and the DAR significiantly reduced the time which the team would otherwise have had to expend simply collecting the information before an evaluative analysis could be done.

## II. INPUT DELIVERY

### A. BUDGET SUMMARY

The responsibility for project financial management is shared by the UF, the GOM-DAR, USAID and the AID/RFMC, making it very difficult to determine expenditures made to date as compared to the estimated budget breakdown contained in the Project Paper (PP). The lack of up-to-date financial information is even more critical in view of several known potential cost overruns. The project budget contained in the project paper estimates technical assistance (TA) costs of $77,792 per annum for each long-term technical assistance and $7,100 per month for short term TA, with a 9% inflation rate allowed. While the inflation rate, at least in the later years of the project, may be overestimated, the fact remains that current TA cost estimates are about 20% higher than the amount budgeted in the PP. The UF has estimated that it will cost $2.38 million to train the full 33 participants scheduled for long-term U.S. training as compared to the $1.48 million budgeted. The cost of the training component has escalated because of (a) delays in commencing some of the training programs until late in the project, (b) a longer period of time required to obtain the desired degrees by a considerable number of the participants and (c) low initial cost estimates for long-term degree training (i.e., $15,870 per annum). Recurrent cost support, however, appears to be overbudgeted by about 40% due primarily to the slow start-up of the project during the initial years when AID was assuming responsibility for a large percentage of the project's local operations or recurrent costs. Lastly, the project's considerable financial pipeline will draw down rapidly because of the large commodity procurement actions recently initiated by UF. In short, there is an urgent need to clearly assess expenditures to date and projected expenditures over the remaining life of the project before any major new commitments are made on existing project funds.

Each financial management entity (UF, DAR, AID/RFMC and USAID) seems to be reporting adequately on past and projected expenditures but the various reporting formats are concerned with only a portion of the project's funds and unfortunately are unreconcilable. Concurrent with assessing the financial position of the project, a standardized reporting system should be developed to permit sound management of the project until it terminates.

Table 1

ESTIMATED CURRENT FINANCIAL POSITION OF PROJECT
(in $000)

| Line Item | PP Budget Estimates | Expended to Date | Proposed Expenditures | Total Planned Actual Expenditures (Column 2+3) | Difference (Column 1-4) |
|---|---|---|---|---|---|
| Technical Assistance | 3102.7 | 1297.9[1] | 1679.2[6] | 2977.1 | - 125.6 |
| Training | 1581.9 | 427.0[2] | 1952.0[7] | 2379.0 | + 797.1 |
| Construction | 2000.0 | | | 1676.0[11] | - 324.0 |
| Commodities | 788.3 | 446.7[3] | 825.0[8] | 1271.7 | + 483.4 |
| Recurrent Costs | 872.8 | 306.9[4] | 128.9[9] | 435.8 | - 437.0 |
| Contingency/ Evaluation | 654.3 | 20.0[5] | 134.3[10] | 154.3 | - 500.0 |
| TOTAL | 9000.0 | | | 8893.9 | - 106.1 |

Notes from Table 1

1- Derived from Appendix 10 of Documents Submitted to the External Evaluation Team - Jan. 1983, prepared by UF team. Figure shown is rounded total of expenditures 5/30/80 - 11/30/82 for wages and salaries, indirect costs, allowances, travel and transport, and other direct costs.

2- Derived from Appendix 10, ibid. Figure shown is rounding of total expenditures 5/30/80 - 11/30/82 for participant costs.

3- Derived from Appendix 3, ibid. Table on Summary of Commodity Purchases. Figure shown is rounded total of first three line items shown in summary table.

4- Derived from Project Recurrent Budget Table prepared by DAR (Feb. 1, 1983). Figure shown is round sum of AID contribution expected through March, 1983, and are Malawi Kwacha converted to dollars at a conversion rate of 1 to 1.

5- Derived partially from AID/RFMC report dated 12/31/82 entitled "Project Financial Implementation Status Report." Figure shown is sum of "Earmarked Amount" for contract (work order) PDC-1406-1 (Thorne Evaluation) and estimated cost of D. Galt participation ($5,300) for present evaluation.

6- Derived from Appendix 10, op. cit. (Jan. 1983). Figure shown is rounded totals of second and third columns for wages and salaries, indirect costs, allowances, travel and transport and other direct costs.

7- Derived from Appendix, 10 ibid. Figure is rounded total of participant costs contained in columns 2 and 3 of table ($1,106) plus estimated amount of funds needed to complete participant training program after the end of contract shown in Appendix 10, ($846). It is assumed that the line item in Appendix entitled "participant costs" includes both short and long term participant training and in-country training costs borne by the project.

8- Derived from Appendix 3, ibid. Figure is rounded total of line items listed in Summary of Commodity Purchases (page 5), entitled "Requisitions to Purchase 11/82 to 1/83, Proposed Expenditures by UF-1/83 to 11/84, Shipping Costs-UF to Malawi, Proposed expenditures in Malawi-Shelf Items". In addition $75,000 was added to cover the procurement of five vehicles and five motorcycles at the end of the project as was proposed on page 25 of the Project Paper.

9- Derived from Project Recurrent Budget Table prepared by DAR (Feb. 1, 1983). Figure shown is rounded sum of expected AID contribution through August, 1984.

10- Amount which may be used for eventual outside consultants for the project. Derived from evaluation team estimates.

11- Taken from "NRDP Agricultural Research Project No. 612-0202, 1983/84 Development Estimates Project Submissions" (undated) prepared by DAR. This revised estimate does not provide breakdown of actual expenditures made to date against estimated future disbursements. We have therefore treated the entire amount as future disbursements.

B. PARTICIPANT TRAINING

There are three principal types of training provided under the project. The project includes support for 1) thirty-three participants to receive long-term training to the M.S. or Ph.D. level in the United States, 2) in-country in-service training for all DAR professional staff, and 3) participation by selected DAR staff in professional meetings, conferences, seminars and workshops both within and outside of Malawi.

Long Term Training: Discipline Selection and Training Duration

The Project Paper (PP) states that "all of the training decisions were based on the specific needs of research components....The training program represents a summation of specific project needs for better trained professional researchers." Thus, a list of training needs was identified in the PP (page 24) as 8 Ph.D. candidates for a total of 288 person months and 25 M.S candidates for a total of 612 person months (See Table 2).

Actual selection of disciplines and level of training has varied considerably from the group originally proposed. Currently, there are 23 candidates in training, 12 at the Ph.D. level and 11 at the M.S. level, with one M.S. candidate retured without degree. The remaining 9 candidates have not been choosen, nor have the degree levels been determined. Table 3 indicates the disciplines and levels of participant trainees sent to date.

Several observations regarding the participant training can be made from a comparison of the plan in the PP and the actual implementation to date:

1. A larger number of candidates are being trained to the Ph.D. level than originally anticipated.

2. Only about 4 of the Ph.D. candidates are being trained in the originally-designated subject areas. Another three candidates are in disciplines originally designated for Master's level training. Thus, five of the 12 candidates are being trained in disciplines outside of the original training plan.

## Table 2

### Disciplines and Levels of Participant Trainees (Projected in PP)

a) Ph.D. Candidates

| Number | Discipline | Months of Training |
|---|---|---|
| 1 | Maize breeder | 36 |
| 1 | Groundnut breeder | 36 |
| 1 | Maize physiologist | 36 |
| 1 | Range management specialist | 36 |
| 1 | Animal breeder | 36 |
| 1 | Plant pathologist | 36 |
| 1 | Entomologist | 36 |
| 1 | Soil physicist | 36 |
| Total of 8 trainees | | 288 person months (24 PY) |

b) M.S. Candidates

| | | |
|---|---|---|
| 1 | Seed technologist | 24 |
| 1 | Maize agronomist | 48 |
| 1 | Groundnut physiologist | 24 |
| 2 | Groundnut agronomist | 48 |
| 1 | Sunflowers agronomist | 24 |
| 1 | Reproductive physiologist | 30 |
| 1 | Animal production specialist | 24 |
| 1 | Pasture agronomist | 30 |
| 1 | Animal nutritionist | 30 |
| 2 | Horticulturalist | 66 |
| 1 | Plant pathologist | 24 |
| 1 | Virologist (plant) | 24 |
| 1 | Entomologist | 24 |
| 1 | Soil physicist | 24 |
| 2 | Soil chemist | 48 |
| 1 | Agricultural engineer | 24 |
| 3 | Agricultural economist | 60 |
| 2 | Applied anthropologist (Farming systems analyst) | 36 |
| Total of 25 trainees | | 612 person months (51 PY) |

Table 3

Disciplines and Levels of Participant Trainees (Actual)

a) Ph.D. Candidates

| Number | Discipline | Months of Training |
|---|---|---|
| 1 | Sorghum breeder | 42 |
| 1 | Sorghum breeder | 42 |
| 1 | Wheat physiologist | 42 |
| 1 | Groundnut agronomist | 42 |
| 1 | Pasture agronomist | 42 |
| 1 | Animal scientist | 36 |
| 1 | Irrigation agronomist | 30 |
| 1 | Plant pathologist | 42 |
| 1 | Entomologist | 36 |
| 1 | Soil scientist (class.) | 36 |
| 1 | Soil physicist | 42 |
| 1 | Microbiologist (soils) | 36 |
| Total 12 trainees | | 468 persons months |

b) M.S. Candidates

| | | |
|---|---|---|
| 1 | Seed technologist (B.S.& M.S.) | 42 |
| 1 | Maize agronomist | 30 |
| 1 | Maize breeder | 24 |
| 2 | Horticulturalist | 30 |
| 1 | Plant pathologist | 24 |
| 2 | Statistician | 48 |
| 2 | Agricultural economist | 48 |
| 1 | Applied anthropologist | 24 |
| 1 | Wheat agronomist | 24 |
| Total of 12 trainees | | 294 person months |

*Provisionally admitted for a M.S. degree in Wheat Agronomy.

Total number of trainees sent as of January, 1983: 24.

3. The increase in the number of Ph.D. candidates has lengthened the number of person months per student and the total number of person years of training. This has two implications:

a. The cost per student has escalated over original estimates.

b. It will be more difficult for returning participants to benefit from the technical assistance provided under the project. Most trainees will return after the PACD.

The PP budgeted for graduate training at the following costs per year (based on a 9% inflation factor):

| FY 80 | FY 81 | FY 82 | FY 83 | FY 84 |
|---|---|---|---|---|
| $15,870 | $17,298 | $18,885 | $20,551 | $22,400 |

Actual costs, due to both duration of training and higher inflation rates, have been considerably greater. The $1,479 million originally budgeted in the contract has been exhausted on the 24 candidates sent to date and UF estimates that another $845,505.56 will be required to complete training of all 33 participants planned in the PP. A rough calculation, using the more realistic number of person months shown in Table 2 and an average cost per participant per year of $25,000[1] shows that $1,644,000 should have been budgeted for the 24 participants sent to date, and that an additional $550,000 will be necessary to send 9 more participants (4 for 36 months each and 5 for 24 months each). Thus, the total cost overrun by this "shadow" calculation would be $714,400, which is not inconsistent with the UF estimate.

## Participant Selection

Some concern has been raised over the equity of the selection process for the individual participants. Almost half of the participant trainees were stationed at the Chitedze Research Station at the time of selection. It was reported to the evaluation team that some professional officers with seniority feel they have been bypassed for staff with less time in service. No formal process exists within the DAR for candidate screening, and the normal GOM process for selection oversight is truncated for participants with AID support.

The PP indicates that there were approximately 65 professional officers (PO's) in DAR who could be considered for long-term training, and that an additional 15 PO's who might be eligible would be hired in the first two years of the project. The PP does not show the distribution of these PO's among stations, nor does it spell out the criteria for defining that applicant pool. It appears that the GOM and the UF team have had to develope criteria for selecting candidates for training.

Table 4 shows the research station origin of the 24 participants chosen at this time and the likely research station posting after completion of training.

1 Figure derived from recent AID project document reviews.

Table 4

Location of Post Prior To and After Training

| Station | Number of Participants | | Percent of Total | |
|---|---|---|---|---|
| | Before | After | Before | After |
| Chitedze | 11 | 11 | 46 | 46 |
| Bvumbwe | 5 | 3 | 21 | 13 |
| Makoka | 3 | 1 | 13 | 4 |
| Mwimba | 1 | - | 4 | - |
| Ngabu | 1 | - | 4 | - |
| Lilongwe (MOA) | 2 | 1 | 8 | 4 |
| Kasinthula | 1 | 1 | 4 | 4 |
| Unknown | - | 7 | - | 29 |
| | 24 | 24 | 100 | 100 |

In response to the concern for distribution of training opportunties among research stations, the team notes that Chitedze is the largest agricultural research station, and is the base for research on the majority of commodities on which the project is focused (i.e. maize, groundnuts, wheat, sunflowers, livestock and seed production). Bvumbwe, the second largest ARS, has the second largest number of participants and will likely receive the second largest number of returning trainees. Bvumbwe ARS, however, has a limited number of activities supported by the AID project (horticulture, potato seed multiplication and soil fertility evaluation and improvement). Makoka, the third largest ARS, is predominantly a cotton research station. The AID project has supported training for the Biometrics Unit at Makoka, but this statistical advisory service will likely be decentralized when all participants have returned. The other eight research stations have between one and three professional officers, and not all of these individuals are in the pool of eligible trainees.

At the time that the PP was written, the 65 potential applicants were identified on the basis of prior education, service with DAR, and area of specialization congruent with identified desciplines in need of upgrading. However, no formal review of qualifications was undertaken. As the project was implemented, though, one criterion which was not explicitly considered in

the Project Paper emerged as the critical decision factor. This was the need for all students attending U.S. universities to attain a minimum score of 1000 on the Graduate Record Examination (GRE). In cases of quantitative scores over 500 on the GRE, the TOEFL could be substituted for a low verbal score, but a satisfactory performance in the latter is still required. For Malawians, who have never been exposed to programmed testing, and who have been trained in an educational system modeled on that of the United Kingdom, the GRE presents a formidable challenge. Many of the initial 65 professional officers have been eliminated for consideration for project supported training because they have been unable to attain the requisite GRE score. This accounts for the abrogation of the conventional seniority system and methodology for choosing trainees. The UF technical assistance team has been attempting to improve GRE performance by intensive preparation in Malawi prior to test administration. However, it is becoming more difficult to locate DAR staff who can qualify and this may slow down the participant training for the remainder of the life of the project.

All departments in the Ministry of Agriculture, including the DAR, are ordinarily required to prepare an annual a list of proposed candidates for overseas long term training. Ordinarily, the candidates must have served at least two years in the MOA before being considered. The list is then consolidated at the ministry level, approved by the Deputy Secretary and passed to the Training Office in the Office of the President and Council (OPC), which seeks scholarships from donors. In these circumstances, the DAR and other departments have primary responsibility for applicant selection. The MOA Training Office acts as a broker with the OPC, which does examine files of participants for which it seeks funding.

The process has not been applied to the AID project, however, as OPC only involves itself in cases of participants for whom it must seek funds. Moreover, the DAR has no formal selection process, and, further, has no overall manpower development plan. Under the project, the DAR has been even more freedom in selection of applicants, as OPC takes the stance that it need not play an active role since funds have already been provided. Moverover, the lack of formalized selection criteria and careful review by an outside entity leaves the DAR open to accusations of favoritism or bias in participant trainee selection.

Selection of Training Site

The PP states that "trainees will be enrolled in universities offering the most appropriate programs in the various specialities." Certain difficulties have been experienced in placing participants in U.S. universities. In addition to the minimum GRE score, students must have had satisfactory educational preparation. This means not only a certain minimum grade point average, but a curriculum that can be "translated" into U.S. standards. As most Malawians were educated under the British system (in Malawi, the U.K., or other commonwealth countries), this "translation" often cannot be made to the satisfaction of the U.S. institution, and students are either rejected or conditionally accepted.

In light of the difficulties experienced in seeking admission for Malawian participants to U.S. institutions, the evaluation team notes in Table 5 that two-thirds of the trainees have been enrolled at University of Florida, which has a vested interest in accepting Malawi students. The remaining third are divided among other U.S. universities.

Table 5

U.S. Universities Attended by Participant Trainees

| University | Number of Participants |
|---|---|
| Florida | 18 |
| Arizona | 1 |
| Oregon State | 1 |
| Mississippi State | 1 |
| Colorado State | 1 |
| Iowa State | 1 |
| North Carolina State | 1 |
| | 24 |

The distribution of students among different U.S universities is generally considered desirable. However, this must be weighed carefully to assure that the institutions have the desired strength or specializations. For example, Mississippi State is well known for its seed production program; similarly Colorado State has a strong irrigation program. However, the relevance of the sorghum program at University of Arizona, as it focuses on irrigated production, to Malawian farming conditions must be questioned. The team believes that diversification of institutions for participant trainees is generally a good thing, but should not be sought as an end in itself. Nor should the availability of a program or the ability of a participant to qualify for a given school be allowed to define the individual's program and overshadow the training priorities of the DAR. These latter should, of course, relate to the national agricultural research priorities of the GOM, which are not well defined.

Conclusions and Suggestions

1. As many of the disciplines originally identified in the PP have been changed in the actual implementation of the participant training program, DAR, UF and USAID should review the rationale behind the current disciplinary mix and reassess the designation of the remaining training positions to ensure that:

(a) postions are allocated to programs of greatest importance to Malawi's research priorities for smallholder agriculture;

(b) training is consistent with the manpower development plan presently contemplated by DAR;

(c) the remainder of the training can be accomodated under the project.

2. The evaluation team finds nothing inherently wrong with expanding the number of Ph.D. candidates at the expense of M.S. candidates. This has several effects of which USAID should be cognizant:

(a) each trainee will require more time to complete his or her program and will be less likely to overlap with the UF technical assistance team, thus jeopardizing the output of an established and sustained program of research relevant to the smallholder;

(b) the cost per trainee is raised; and

(c) since a Ph.D.-trained a professional is more specialized, areas of concentration must be more carefully monitored to assure consistency with the project's objectives.

It is recommended that in the proposed follow-on project, technical assistance be planned in such a manner that it maximizes the investment in participant training under the present project. USAID and the DAR should seek to assure that those participants who return to Malawi to conduct thesis or dissertation research be unencumbered with administrative tasks so as to expedite the completion of their academic work. This is another reason for assuring continuity in the provision of technical assistance. Returned trainees should also be encouraged to retain flexibility in their specialization so that if they are needed in higher priority programs (e.g. a wheat agronomist moving to maize, or a soybean breeder changing to groundnuts) they can do so with a minimum of retraining and attitudinal adjustment. Malawi cannot afford researchers whose disciplinary interest take precedence over national research needs.

3. The funding gap should be closed by whatever means USAID chooses to assure that 33 participants will be trained under the project. The team finds the additional $845,500 to be justified, as the PP did not anticipate the extended period of training and rapid escalation of cost per trainee.

4. The team finds the distribution of training opportunities among agricultural research stations to be reasonable. While acknowledging that it would be desirable to have a greater number of participants drawn from stations other than Chitedze, as it affects the morale of the DAR, we recommend that academic qualifications in the targeted disciplines outlined in the PP continue to be the primary criterion upon which participants are selected. We would suggest that if non-targeted programs have surplus staff (i.e., cotton), then the surplus researchers be considered for training in the areas of concentration of the project (i.e., retraining cotton breeders as maize breeders).

5. The team feels feels that the evolving reorganization plan will address the issue of distribution of returned trainees among research stations and programs. However, we wish to reiterate that all parts of Malawi should benefit from the newly-acquired expertise.

6. The Graduate Record Examination has posed a significant obstacle to the use of seniority as a criterion for participant selection. To safeguard against accusations of bias, DAR should draw up formal candidate selection criteria and formalize the selection process so that it is well understood by all DAR and relevant ministry staff. Further, OPC should have an opportunity to monitor the progress of trainees funded under the project. USAID should ensure that OPC's files on project participants are updated and that all future progress reports are copied to the Training Office, OPC as well as to CARO.

7. USAID should encourage and assist the DAR to develop a long-term manpower development plan so that training needs and opportunities can be more closely coordinated.

8. The team encourages continued diversification of training sites in the U.S. The quest for diversification should be tempered by the need for programs relevant to Malawi agriculture, and the UF technical assistance team should assume the responsibility of assuring that programs are chosen to accord with Malawi's requirements rather than vice versa.

Every indication is that most of the 24 participants sent for training to date will successfully complete their degree programs. (One trainee had to be terminated after two years due to unsatisfactory performance.) It is becoming increasingly difficult to find qualified applicants, however, and the remainder of the training may occur at a slower pace. Moreover, if funding is not shifted from other elements of the project or augmented from other USAID sources, there can be no additional training under the project. As this is one of the potentially most successful aspects of the project, the evaluation team recommends DAR redouble its efforts to identify appropriate candidates and that USAID locate additional funds to complete the scheduled training of all 33 participants under the project.

The lengthened training schedule occasioned by the increased number of Ph.D. degrees sought under the project will affect the project's ability to achieve the aim of having "an additional eight professional research personnel functioning at the Ph.D. level and 25 at the M.Sc. level in research programs relevant to smallholders" by the end of the project. It will particularly affect the ability of the newly-returned researchers to benefit from the guidance of the technical assistance team and the continuity the latter have provided while participants were absent. This can be addressed in two ways. First, the project has yet to utilize approximately one half of its person months of short-term technical assistance. To the extent possible, this short-term technical assistance should be scheduled to assist returning trainees in fitting into established relevant programs of research or initiating new programs consistent with national priorities and the "smallholder concentration." As the goal of the project is to be attained over a 15-20 year time period, it would be appropriate for the technical assistance provided under the follow-on project to be closely coordinated with the programs to which returning trainees will be assigned. This would improve the effectiveness of both training and technical assistance and yield the highest return on the USAID's investment in training.

In-service Training

The PP provides funding ($102,300) for in-service training but no further description of the training is included. Thus, the UF technical assistance team has been responsible for defining local training needs and responding to those needs. The most pressing training need was found by UF to be in basic research design. A number of courses on the farming systems approach to research were also offered. The courses are generally offered to 25-40 participants, which represents one fourth to one third of the DAR professional officers. In addition, each short-term technical advisor from UF is required to present a lecture or seminar during the course of his/her TDY.

Table 6 lists the in-service training offered under the project thus far. According to the UF Quarterly Report for October-December 1982, $79,879.19 of the $102,300 allocated have been expended or encumbered, and $22,420.81 remain. This budget is also used to cover expenses for the conferences and other professional activities discussed in the next section.

Table 6

In-Service Training Courses Seminars and Lectures

(a) Courses

| Title | Instructor | Dates |
|---|---|---|
| Crop Ecology | Dr. D.E. McCloud | March-April 1981 |
| Crop Yield Dynamics | Dr. D.E. McCloud | Aug.31-Sept.5, 1981 |
| Potato Production | Dr. D.R. Hensel | April 26-30, 1982 |
| Fruit Crops | Dr. C. Arnold | May 18-21, 1982 |
| Experimental Design and Research Methodology* | Dr. D. Hicks | Sept. 6-10, 1982<br>Sept.13-16, 1982 |
| On-Farm Trials: Design and Analysis | Dr. P. E. Hildebrand<br>Dr. J. Jones<br>Dr. A. Hansen | Oct. 4-8, 1982 |

(b) SEMINARS

| | | |
|---|---|---|
| Intercropping | Dr. A. Hansen<br>Dr. O. T. Edje<br>Dr. I. McLean | Oct. 20, 1981 |
| Socioeconomic Research | Dr. A. Hansen | Jan. 23, 1982 |

(c) LECTURES

| | | |
|---|---|---|
| What Determines Farmer Interest in Adopting Improved Technology: An Economic Perspective | Dr. M. R. Langham | February 20, 1981 |
| Farming Systems Research: Theory and Practice in Malawi* | Dr. A. Hansen | Sept. 25, 1981<br>Oct. 30, 1981 |
| The Importance of N,P,K, Uptake to Plant Physiology and Deficiency Disorders. | Dr. D. N. Maynard<br>Dr. I.B. McLean | March 15, 1982 |
| Quantitative Aspects of Water and Agro-chemical Management in Crop Production* | Dr. S. Rao | Aug. 16, 1982<br>Aug. 23, 1982 |

*Offered twice.

| | | |
|---|---|---|
| Soil Testing and Recommendations to Florida Farmers Using the Computer | Dr. C. Eno | November 1982 |
| Low Energy Agriculture for Smallholders | Dr. H. Popenoe | November 17, 1982 |

It is recommended that in order to assess the utility of the above courses, UF should survey the participants approximately one year after the date of the course. The survey should ask for both a subjective assessment of course presentation and factual record of utilization of course materials/information in the interval since the course was offered. Further, the team recommends that future courses have an immediate participant evaluation to alert the technical assistance staff to the strengths and weaknesses of the in-service training.

Participation in Professional Meetings, Conferences, Etc.

In "Documents Submitted to the External Evaluation Team-January 1983," the UF team has presented a complete list of professional participation by DAR staff in opportunities for contact both within and outside Malawi. The evaluation team notes two concerns:

1. The opportunities do not seem adequately distributed among the research staff. Many of the same individuals appear on the list repeatedly.

2. Bvumbwe, the second largest ARS, has not responded to requests from CARO for nominations to such professional activities.

The evaluation team recommends that CARO be asked to take a more active role in participant nomination to assure that the benefits of this funding are equitably distributed. USAID should continue to monitor this program with the above concerns in mind.

On-the-Job Training

The UF Quarterly reports detail a substantive amount of on-the-job training (OJT). For both the agricultural economics and farming systems sections, this has included familiarization with the HP 85 and Apple II+ Microcomputers for data storage and analysis and word processing. Other sections have trained staff in the use of the HP41CV and TI55 programable calculators.

Much of the research staff at Chitedze has benefited from close supervision by the technical assistance team in areas of research design, implementation and analysis. A few of the professional officers from other ARSs have interacted with the UF team in carrying out trials designed at Chitedze.

On-the-job training is an important aspect of the presence of the technical assistance team. It is especially critical for those returning from training in the U.S., and every effort should be made in the follow-on project to assure that the OJT continues. Under the current project, the OJT will be enhanced by the recruitment of the horticulturalist to be placed at Bvumbwe. As this type of training is generally informal, frequent contact with the technical assistance team is necessary for greater effect.

C. TECHNICAL ASSISTANCE

The technical assistance provided by the project is from the University of Florida (UF). This project was one of the first Title XII collaborative mode contracts. In this mode, the Title XII institution participates in the final design of the project and implements the project when approved and funded. The intent of such an arrangement is to reduce the lead time required for a University to mobilize appropriate resources and commence project implementation. Unfortunately, there were unexpected delays in executing the contract with UF, which caused UF to lose several of its intended team members. It is clear that the unexpected delay has had a negative impact on project implementation. It appears that the project designers wrote the project job descriptions with fairly specific individuals in mind but could only field part of that team by the time the contract for technical assistance was finally signed. As a result, the particular skills mix of the team actually fielded has not been as comprehensive as what seems to have been intended at the time the project was designed. For example, the PP called for a crops agronomist who was expected to work on a variety of food and forage crops. The individual fielded was primarily a forage crops agronomist and as a result, food crop agronomic research was somewhat neglected during the early years of the project.

Secondly, it is obvious that the designers of the project did not fully anticipate the effect on on-going research programs of sending half of the DAR's best staff on long term training. The four or five expatriate researchers are finding it extremely difficult to fill in for the 23 Malawian researchers now in training. Most of the UF researchers have become heavily involved in the management of their respective research sections as well as certain management functions associated with the project (managing participant training, commodity procurement, reporting, etc.) In addition, they are often called upon to perform valid tasks for the DAR but which were not anticipated at the time of the design of the project, such as advising on the restructuring of the DAR. Given this formidable workload some functions originally planned to be performed by the technical assistance team are receiving less attention than intended. For example, the team members almost unanimously recognize and regret the fact that they are not providing more on-the-job training and supervision for junior research staff.
The team, in general, has tended to place less priority on following closely the various research programs in progress and working closely with research staff and extension personnel to develop research recommendations and conducting adaptive on-farm trials. Rather, they have tended to give higher priority to research program planning and management, developing longer term research priorities. However, given (a) the present workload, (b) the priorities established for institution building contained in the project paper and (c) the fact that for the most part, they are not very familiar with the

intricacies of smallholder production operations, having been in Malawi for a relatively short time, we believe the UF has prioritized research needs as well as could be expected. We do stress however that higher priority should be given to working with the Malawian research staff remaining in country and with participant trainees as they return.

Thirdly, the skills mix of the technical assistance team contained in the project paper leads one to believe that most of the expatriate researchers were to advise on several crop programs. For example, the plant breeder would assist in plant breeding for maize, wheat, sorghum, and other grain legumes etc. The agronomist would also assist various commodity programs. Furthermore, the individual expatriate researchers would work as an interdisciplinary team each making some contribution to improving the technical quality or relevance of the various research programs to the smallholder farmer. It appears that the individual team members have tended to specialize in particular crops and advise on several research disciplines within that particular commodity program. Such specialization deemphasized the importance of the multi-disciplinary team approach intended in the project design. With the recent arrival of an agronomist and the presence of a plant breeder, a plant physiologist, agricultural economist, anthropologist and animal production specialist, we recommend the interdisciplinary team approach be revived and made operational.

Fourthly, we have reviewed the individual UF technical assistance team members' job descriptions in conjunction with the job decriptions indicated in the project paper. The team members' qualifications appear to adequately match the requested requirements. However, it is clear that more experience in agricultural research in developing countries, particularly in Africa, would have been beneficial. As has been noted and recommended in the previous evaluation and audit, we concur that the individual researchers should be expected to draft detailed work plans shortly after their arrival in-country and have such work plans reviewed and approved by the UF team leader, USAID/Malawi and the CARO. According to our information, formal work plans were not written until quite recently.

Fifthly, the evaluation team notes that the planned technical assistance for horticultural research is severely delayed. To expedite this program, the UF has proposed posting two horticultural specialists (one concentrating on tree and fruit crops and a second on vegetable production) for the balanced of the project. While fully cognizant of the need to provide the planned technical assistance and assist in improving the DAR's horticulture research program, the evaluation team is not of the opinion that two individuals (each for a relatively short period of time) can have much of a long-term impact on the on-going horticulture research.

Lastly, the technical assistance contract has provided numerous short term consultants to the project. The evaluation team notes that most of the short term consultants were in-country for a duration of two weeks or less and that few of the technical short term consultants (as opposed to administrative short term assistance) have made repeated trips to Malawi. The team would have preferred to see fewer numbers of consultants, longer durations of the consultancies and key types of technical expertise returning periodically to assist the various sections of the DAR.

Long Term Technical Assistance Provided to Date:

1. Darell McCloud, Ph.D. Agronomy. Job description: Research Coordinator and Chief of Party. Dr. McCloud serves as head and coordinator of Oilseeds Research Section and has conducted field experiments on groundnut growth and production as well as serving as Chief of Party. Tour: June 14, 1980-September 30, 1984.

2. E. M. Hodges, Ph.D. Agronomy. Job description: Agronomist. Dr. Hodges worked in the field of forage agronomy and production serving as coordinator of Fodder and Pasture Crops Section. Tour: October 11, 1980-November 15, 1982.

L. J. Janicki, Ph.D. Agronomy. Job description: Agronomist. At the time of this evaluation Dr. Janicki had just arrived was being oriented to the DAR and preparing his work plan. Tour: January 1, 1983-September, 1984.

3. I. B. McLean, Ph.D. Horticulture. Job description: Horticultural. Dr. McLean served as the coordinator of Horticulture Research Section until his resignation in May 1982. Tour: August 22, 1981-May 31, 1982.

C. Arnold, Ph.D. Horticulture. Job description: Horticulturalist. Dr. Arnold will be concentrating on tree crops and fruits. Tour: April, 1983-September 30, 1984 (pending approval).

An additional horticulturalist position is envisioned by UF but not yet recruited for or filled.

4. S. F. Pasley, Ph.D. Plant Breeding/Genetics. Job description: Plant Breeder. Dr. Pasley serves as the head and coordinator of the Maize Breeding Section and more recently as head of the new Wheat Section. His work now includes agronomic considerations of maize and wheat in addition to maize varietal selection. Tour: September 30, 1981-September 29, 1983.

5. D. W. Pervis, Ph.D. Agricultural Economics. Job description: Agricultural Economist, head of the newly created agricultural economics section. Tour: September, 1981-September, 1983.

6. A. Hansen, Ph.D. Anthropology. Job description: Farming Systems Analyst, head of the newly created Farming Systems Analysis Section. Tour: January, 1981-April, 1983. It is expected that Dr. Hansen will continue to provide assistance to through several short term consultancies over the remaining life of the project.

7. R. C. Gray, Ph.D. Animal Husbandry. Job description: Animal Scientist, head of the Livestock Research Section and frequent advisor to the Forage and Pasture Research Section since the departure of Dr. Hodges. Tour: September, 1981-September, 1983.

D. COMMODITY PROCUREMENT

The Project Paper budgeted $738,000 for the procurement of project commodities. Of this amount, slightly over $250,000 was estimated to be needed for vehicles and motorcycles and the balance $540,000 was intended for research equipment, supplies and materials. Expenditures to date for vehicles and motorcycles are at the budgeted amount. Expenditures to date for commodities are at about $340,000, although this amount contains expenditures for household equipment and furnishings which should probably be charged to the Technical Assistance line item of the budget rather than the commodity line item. The UF has proposed to order additional commodities which will cost about $600,000 shipped to Malawi. Thus the total amount planned for commodity procurement by the project is about $500,000 over the amount originally budgeted in the Project Paper. This overrun can probably be reduced if some of the commodities procured to date can be charged against other line items in the project or in the UF contract.

The procurement and delivery of commodities is behind schedule. The PP design expected 82% of the funding for commodities to be expended during the first two years of the project. The delays in commodity procurement appear to be caused by (1) delays in the construction of laboratory buildings which will house a large portion of the research equipment and (2) slowness on the part of the project contractor to honor procurement requests. The delay caused by slow action on the procurement of commodities has been noted in earlier evaluations and audits. UF supposedly has improved commodity procurement arrangements and will be able to move more quickly on requested commodity procurement action. A major commodity order has recently been requested of the UF/Gainsville and it appears that procurement is moving adequately. It should also be noted that some delays in commodity procurement has been caused by shipping problems. Malawi, a landlocked country, is experiencing acute shipping and transportation problems in its traditional shipping routes through Mozambique and South Africa. These problems are anticipated to worsen over the foreseeable future and may eventually require the project to use alternative shipping routes which may result in higher shipping costs.

Delays in the procurement of commodities, especially sophisticated laboratory equipment, may well result in the equipment becoming fully operational near the time that the project technical assistance will be departing. The evaluation team is concerned that Malawian research staff may not be fully prepared to utilize and maintain the equipment properly. The degree to which this will become a problem depends on how quickly the UF and USAID can sort out the financial position of the project, place orders, ship and assemble the needed equipment. We would suggest that if the soils laboratories and the forage and feeds laboratory are not functional before September 1983, then the technical assistance component of the project should be extended by about a year to insure that Malawian staff is fully capable of operating and maintaining the project equipment.

Concern has been raised about the degree of technical sophistication of many of the research commodities being procured by the project, specifically the computer equipment and laboratory equipment. The evaluation team has tried to examine this problem and on that basis, concludes that (1) the

equipment is needed and is expected to be fully utilized during the project, (2) the project paper correctly acknowledged that the present technology used in conducting scientific agriculture research was a constraint on research results and more sophisticated research equipment was needed to improve research output, and (3) the introduction of a higher level technology for conducting agricultural research may be beyond the financial means of the DAR and the GOM. Concerning the last point, it is difficult to predict how much of a problem the new equipment will pose. We would suggest however that (1) the DAR and the UF monitor closely the costs involved in servicing, operating and maintaining the new equipment being introduced by the project and estimate the financial implications of using such equipment, and (2) any AID-funded follow-on project consider assisting the GOM and the DAR to cover the recurrent costs of this equipment, at least the foreign exchange portion of such recurrent costs.

In sum, delays have been encountered in the procurement of project-financed equipment and consequently cost overruns are expected. We were unable to determine whether other funds within the project will be available to cover these costs. Delays in procurement will also result in some of the equipment becoming operational late in the life of the project. Prompt procurement action now may considerably mitigate this expected consequence. The commodities being procured by the project to date and those proposed do not deviate substantially from what was planned in the project paper. Finally, we note that some of the equipment being procured is technologically more sophisticated that equipment used in the past by the DAR. We conclude that the level of technology of the equipment being procured by the project is justified and expect that it will be fully utilized. We are concerned, however, by the financial burden such technology may place on DAR and the GOM and suggest USAID explore various possibilities of shouldering at least a portion of this financial burden for the next several years.

## E. RECURRENT COST SUPPORT

It was recognized during the PP design that the project would require an expansion of the DAR's operating budget (revenue account) and AID agreed to finance recurrent costs attributable to the project on a declining percentage basis over its five year life. AID agreed to finance 100% of recurrent costs of the project during its initial year and then reduce this contribution by 20 percent annually thereafter. The initial expected configuration of this budget support as compared to actual expenditures and current projections is as follows:

| Project Year | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|
| Projected AID Contribution in PP (in $000) | 130.5 | 290.2 | 209.6 | 160.6 | 81.9 | 872.8 |
| Actual and Projections of AID contributions (in $000) | (171.3) | | 135.6 | 101.5 | 27.4 | 435.8 |

The shortfall in recurrent cost support expenditures by AID resulted from a slow start-up of project activities during the initial years of the project, a devaluation of the Kwacha against the U.S. dollar and a general slowing up of the growth of the Malawian public sector due to formidable budgetary constraints. The delayed start-up of project activities generally meant that a larger share of recurrent had to be assumed by the GOM. This placed limitations on the growth of the overall revenue account and reduced allocations to the DAR as a whole. As a result those areas of research not supported by AID may stagnate while areas of research supported by the project absorbs the modest levels of increased funding made available to the DAR from the GOM's budget.

The procedure established for AID financing project recurrent costs is that the GOM makes disbursements from its budget and then claims reimbursement for the percentage established in the Grant Agreement which AID has agreed to pay for each specific year of the project. The declining percentage which AID has agreed to pay is apparently pegged to the U.S. fiscal calendar, and determining the amount payable for a specified time period then requires multiple calculations. To date the procedure appears to be working satisfactorily. The single problem noted by the evaluation team is that USAID/Malawi's files shown only the amount in Kwacha to be reimbursed with no equivalent dollar amount shown.

It would appear, however, that the DAR is not, in fact, acquiring additional resources for its agricultural research program from AID's funding of recurrent costs. AID's funding of recurrent costs appears to be direct budgetary support to the GOM pegged to GOM expenditures in agricultural research. The DAR receives its annual budget in which certain items are eligible for reimbursement from AID. Once funds are expended on the agreed-upon items, AID reimburses the GOM Treasury. Treasury, to the best of our knowledge, holds those funds and does not increase the DAR's budget by a similar amount. While there is nothing inherently wrong with such a system for financing recurrent costs, it is a questionable inducement for encouraging the GOM to allocate a greater part of its overall budget to agricultural research and does not provide readily available funds to the DAR for commencing in certain new activities.

The GOM appears to be meeting its commitment to shouldering the recurrent costs of the project (See Table 7). Unless budget projections change substantially during the last two years of the project, the GOM should be able to sustain research activities begun by the project when AID support is terminated. However, the growth and expansion of research activities commenced by the project may be slow, especially for those activities which entail considerable transportation costs (i.e. farm surveys and on-farm trials).

Table 7

Operational Budget (Revenue Account) for the Department of Agricultural Research 1
(in MK)

| Line Item | 82/83 Final[2] Revised Budget | 83/84 Approv.Budget | 84/85 Forecast | 85/86 Forecast |
|---|---|---|---|---|
| 01-Salaries/wages | 958,000 | 1,149,811 | | |
| 02-Temporary staff | 470,433 | 559,473 | | |
| 04-In-Country Travel | 417,900 | 600,000 | | |
| 06-International Travel | 15,500 | 17,400 | | |
| 07-Telephone/Telegraph and Postal Charges | 67,500 | 75,000 | | |
| 08-Utilities/Supplies | 927,000 | 830,292 | | |
| 09-Professional subscriptions and member dues | 64,471 | 82,340 | | |
| 10-Research Operations | 236,738 | 254,061 | | |
| 16-Building Maint. | 82,500 | 92,623 | | |
| Gross Research Expenditures | 3,239,948 | 3,670,000 | | |
| Projected Inflows from Research | ( 139,500) | (157,000) | | |
| Net GOM public Allocate to DAR | 3,100,449 | 3,513,000 | 3,885,930 | 4,249,950 |

1 - This budget covers GOM contributions to research operations including project research activities. AID contributions to recurrent research costs are not included as a separate line item.

2 - Malawian Fiscal Year commences April 1 and closes on March 31 of the following year.

Table 8

Project Recurrent Cost Support Budget
(in MK)

| Period of Time Covered | Total | Contributions | |
|---|---|---|---|
| | | AID Contribution | GOM Contribution |
| Inception to 8/81 | 67,629.07 | 54,103.26 | 13,525.81 |
| 4/81 to 9/81 | 19,836.80 | 15,869.44 | 3,967.36 |
| 10/81 | 22,306.94 | 17,845.55 | 4,461.39 |
| 11/81 to 3/81 | 139,120.50 | 83,472.30 | 55,648.20 |
| 4/82 to 9/82 | 122,679.51 | 73,607.71 | 49,071.80 |
| 9/82 to 11/82 | 64,920.04 | 25,968.01 | 38,952.03 |
| 12/82 to 3/83* | 90,000.00 | 36,000.00 | 54,000.00 |
| 4/83 to 3/84* | 376,000.00 | 101,520.00 | 274,480.00 |
| 4/84 to 9/84* | 136,970.00 | 27,394.00 | 109,576.00 |
| TOTAL | 1,039,462.86 | 435,780.27 | 603,682.59 |

*Estimates.

F. CONSTRUCTION

The construction component funded by the project is progressing well. About 70% of the planned construction has been completed. A listing of all completed and proposed structures appears on Table 9. The major outstanding items in the construction component are the wheat facilities to be located at Tsangano Research Station and the Soils Laboratory at the Bvumbwe Research Station. Construction at both of these sites has only recently begun. A substantial number of the new facilities are actually in use. The quality of the construction appears high as substantiated by the periodic reports made by visiting REDSO/ESA engineers. A recent audit of the project indicated there had been some minor irregularities in the host country contract for the construction of one of the buildings and that matter is being resolved.

In general, the construction component is upgrading the physical plant of the DAR and will particularly benefit the plant breeding and soil sections of the DAR. The wheat improvement program will also acquire physical facilities in Malawi's highest potential wheat area. The project has constructed numerous lodgings for research personnel. In some part of the country, such construction is entirely justified while in other areas of the country, one would question whether the GOM can afford to continue subsidized housing for government employees.

Table 9

Completed and Proposed Construction

| Housing Type | Qty. | Location | PP Estimate | Recent Estimate | Completion Date |
|---|---|---|---|---|---|
| B2A | 3 | Chitedze | 157,380 | Total | |
| B3 | 5 | Chitedze | 218,500 | | December 82 |
| DH6 | 10 | Chitedze | 264,000 | | |
| PH4 (mod) | 5 | Chitedze | 46,970 | | |
| | | | 686,850 | 846,030 | |
| B2A | 1 | Bvumbwe | 53,680 | | |
| B3 | 3 | Bvumbwe | 135,500 | | |
| DH6 | 3 | Bvumbwe | 82,350 | | September 81 |
| PH 4 (mod) | 3 | Bvumbwe | 29,280 | | |
| EL2 | 1 | Nsanje (Makhang St.) | 11,834 | | |
| CH10 | 2 | Tsangano | 78,080 | Total | Building site |
| DH6 | 1 | Tsangano | 31,720 | | chosen |
| PH4 | 3 | Tsangano | 33,306 | | January 83 |
| | | | 143,106 | 174,050 | |
| DH6 | 1 | Mzimba | 30,256 | | |
| PH4 | 1 | (Mbawa Res. Station) | 10,736 | | May, 81 |
| DH6 | 1 | Kasinthula | 29,800 | | |
| PH 4 (Mod) | 1 | Kasinthula | 10,980 | 12,950 | Aug. 81 |
| PH 4 (Mod) | 1 | Kaalazi | 10,780 | 12,950 | |
| CH 10 | 2 | Makoka | 78,080 | | Aug. 81 |
| DH 6 | 1 | Lunyanga | 27,572 | | Aug. 81 |

(b) Other facilities

| Facility | | | | |
|---|---|---|---|---|
| Groundnut Cold storage Room | Chitedze | | | |
| Maize Cold Storage Room | | Chitedze | 21,960 | |
| Maize Green-house | Chitedze | 26,000 | | |
| Horticulture Storeroom | Chitedze | | | December 82 |
| Horticulture Greenhouse | Chitedze | | | |

| | | | | |
|---|---|---|---|---|
| Horticulture Storeroom | Bvumbwe | | | |
| Horticulture Greenhouse | Bvumbwe | | | |
| Soils Lab | Chitedze | | | |
| Soils Greenhouse | Chitedze | | | |
| Soils Lab | Bvumbe | | | June 83 |
| Soils Greenhouse | Bvumbwe | | | |
| Smallholder Approp. Tech. Storeroom | Chitedze | | | |
| Smallholder Approp. Tech. Shed | Chitedze | | | |
| Smallholder Approp. Tech. Storeroom | Bvumbwe | | | |
| Smallholder Approp. Tech. Office | Bvumbwe | | | |
| Wheat Office | Tsangano | | | Building site chosen Jan. 83 |
| Bean Greenhouse | Bunda | 25,000 | | Est. June, 83 |
| Bean Office/ Lab | Bunda | 17,560 | 18,200 | March 83 |
| Research Office Block | | Chitedze | | December 82 |

## III. OUTPUT DELIVERY

### A. AGRICULTURAL ECONOMICS SECTION

#### Introduction

The Agricultural Economics section is one of the two new sections to be instituted under the UF/USAID contract. Dr. Dennis W. Pervis, an agricultural economist, arrived in September, 1981 to head this section.

#### Project Inputs

A. Desktop (Micro) computers

1. HP85: one is available in the economics unit at Chitedze and one in the Biometrics Unit at Makoka. They are in good working condition (see Table 9 for those analyses which can be performed by this machine in the economics unit).

2. Apple II+: Three exist at project headquarters. One each with the (a) economics unit, (b) livestock unit, (c) main headquarters building. All are in good working order. Table 10 contains those economic analyses which can be performed by the economics unit on this computer.

3. HP41 CV: Several of these hand-held programmable calculators are available in-country. The economics unit has one which functions quite well. Table 9 contains the analyses which can be performed by these calculators.

B. Professional Textbooks

The first order of agricultural economics reference texts for the economics unit (21 books in all) was placed in February, 1982. The books have not yet arrived, although UF ordered them in November, 1982 and they are now enroute to Malawi. A second order of agricultural economics reference books is pending.

- Comment: This length of time lag between purchase request and delivery is not consistent with good project backstopping.

#### Project Outputs:

Neither the Outputs section (pp.15, 16) nor the Logical Framework (Annex B) of the Project Paper list anything specific for the economics section. The Outputs section does state that

"The Title XII team will have introduced new research programs in farming systems analysis, production economics and smallholder appropriate technology and will have improved the capability of the D.A.R. in research coordination for the selection and implementation of research benefitting smallholders and in research/extension liaison" (PP, p.15).In addition, the job description duties listed for the research economist in the Long Term Technical Assistance Job Descriptions (Annex A) of the PP differ from Work Plan of the agricultural economist provided by UF (Documents Submitted to the External Evaluation Team, pp. 14-16). Both the original job description and the work plan are provided in Appendix 2.

Table 10

Existing Analytical Programs in the Agricultural Economics Unit

| Type of Analysis | Program Currently Exists for Following Calculators: Apple II+ | HP 85 | HP41CV |
|---|---|---|---|
| 1. Multiple Linear Regression (Independent Variables) | Yes | Yes | No |
| 2. Multiple Linear Regression (2 independent variables) | Yes | Yes | Yes |
| 3. ANOVA | Yes | Yes | Yes |
| 4. Plotting Analysis | Yes | Not easy | No |
| 5. Financial Analysis: IROR | On order | Yes | No |
| 6. Financial Analysis: NPV | On order | Yes | No |
| 7. Optimal Level of Fertilizer Calculation | No | No | No |
| 8. Calculation of Area of Irregularly-shaped Farms | No | Yes | No |
| 6. PERT/CTM Analysis (project scheduling and costing via critical path analysis) | Yes | No | No |

In terms of agricultural economics, the work plan lists six objectives. The first is to (1) establish an agricultural economics section. This has been done at the Chitedze station, and the section consists of Dr. D. W. Pervis, head; Ms. R. Chikwana (who is completing her M.S. thesis); Mr. A. Jere; Ms. B. Nthakomwa (who has gone to UF for a M.S. in agricultural economics); Mr. F. Nuondo; Mr. C. Mwansambo (a systems analyst); and Mr. D. Kanwijo (skilled laborer).

A problem noted by this section concerns staff selection. The section head was initially told he would participate in the staff selection process. After an examination in agricultural economics, and a personal interview, 15 potential candidates were narrowed to the top candidate, whose name was submitted to MOA. This candidate was unacceptable because the wrong selection procedures were followed. The MOA then assured the section head that he would be on the selection committee. Months later, after hearing nothing about a candidate selection committee meeting, candidates were named to the section. In short, not all candidates for the agricultural economics section share a high aptitude for economic theory and problem-solving.

The section currently contains at least one PO, TO and TA.* It seems to be adequate for a section less than two years old. The project is ahead of schedule in trainee education, as two staff members have already been sent to the U.S. for further study, and one (Ms. Chikwana) has returned and is completing her M.S. thesis. One candidate remains to be selected.

The section has actively established sources of basic country data, along with the FSA section. The four major sources of farmer-related data are: (1) National Census (every five years; latest available is 1977); (2) Monthly Statistical Bulletin (published by the National Statistics Office); Agro-economic Survey; and (4) NSSA, or National Sample Survey of Agriculture. The section has been actively storing this data into their own Data Bank. Such storage includes coding many national variables (crops, regions, ADD's, etc.), and has led to a publication detailing such coding. The MOA is also beginning to use this coding procedure.

In terms of systems analysis for research planning and policy development, this is a long-run priority of the section. The section head has learned that the section may have some policy input into the sub-OPC levels of the GOM. Many current policy decisions are piecemeal: if the GOM raises the price of maize, for example, then people may wonder why the land area planted to groundnuts is declining. The economics section believes that an impact via marketing could be substantial if ADMARC were not involved in pricing policy decisions. As it is, Malawi smallholders have no tradition of "jobbers" (middlemen), intermediate marketers; but must depend on ADMARC, both for input purchase and for output sales. However, training would be necessary before an intermediary marketing cadre could be established. In addition, a policy change would be necessary to allow such a function.

New computers have been introduced into the section. They are in use at section headquarters. The A-STAT program has been introduced to the staff of agricultural economics and FSA during a training session. No formal courses have been given to researchers or ADD-level staff on the use of hand-held calculators (i.e., the HP41CV) for simple economic evaluations of agronomic trials (for instance, using the CIMMYT manual by Perrin, et.al). Finally, a major concern of the section head is what will happen to the computer equipment when he leaves Malawi. The current staff does not know how to handle and care for it properly. However, both Ms. Chikwana and Ms. Nthakomwa should receive on-the-job training in computer maintenance and be fully qualified in computer operations before the departure of the UF team.

The second objective of the work plan is to (2) establish new research. This is being approached from two angles:

(a) Policy maker level, and
(b) Smallholder:

At the policy level, research is longer-run and may be a politically sensitive issue. Regarding research at the smallholder level, the section is attempting to analyze research in two areas:

(a) appropriateness of introduced technology, and
(b) modification of the socio-economic environment of the smallholder via GOM policy to allow successful adoption of new technology.

Specific outputs of the agricultural economics section are listed in Appendix 3 entitled "Publications of the Agricultural Economics Section". Topically, research addressed two problems in conjunction with the farm mechanization unit (Nos. 1 and 7), one problem in relation to the unit farms on experiment[1] stations (No.3), one irrigation feasibility problem (No.2), two data base issues (No. 4 and 5), and one multidisciplinary problem with maize and FSA (No. 6).

The third work plan objective is to (3) conduct in-service training for agricultural economics counterparts, and others. Work plan objective (1) contains a description of training vis-a-vis hand-held calculators. In tion, a basic short course on both micro-and macro-economic principles is being prepared by the section head. Discussions about this course revolve around which level of participants to invite: station-level PO's and/or ADD-level TO's/TA's. The level of such a course will have to be developed dependent upon the selected participants' training level. The decision on this should be made soon by Drs. Mwandamere and Pervis. The practical, non-formal training given to the section staff regarding computer use is complete.

A potential problem has arisen in agricultural economics training, regarding travel. According to the head of the section, six specific requests were submitted, and subsequently denied, for travel to visit international research centers' agricultural economics sections (or for visits to neighboring country agricultural economics sections or departments). It should be noted that "hard" agricultural scientists are not the only ones to

benefit from visits to international research centers. By systematically denying the requests of agricultural economists to form or renew professional linkages with those working nearby under similar conditions, the MOA/UF project risks the danger of the "hard" agricultural scientists progressing much faster than the "soft" economists in being exposed to and accepting new ideas from outside Malawi.

The fourth work plan objective is to (4) issue research for technical officers and technical assistants in extension service dealing with agricultural economics and farm management. Two publications from the section appear to be appropriate for extension purposes. These are (1) "An Analysis of the Introduction of the Eicher Tractor into Malawi" and (2) "Economic Evaluation of Powertiller Vs. Oxen for Rice Production in Malawi" (see Appendix 3). No other farm-level publications relating to agricultural economics or farm management have been published by the section.

The fifth work plan objective is to (5) establish baseline data for 110 to 130 EPA's. Apparently the MOA expects the ADD's assisted to be present at a MOA workshop on planning methodology held in January, 1983. No further progress has been made in ADD baseline data collection.

The sixth (and final) work plan objective is (6) other project-related activities. The section head has put less effort into such activities, which include the following:

(a) Serve as head of agricultural economics section (redundant with objective (1); (b) Attend team (UF) meetings; (c) Prepare required reports; (d) Prepare for reviews, including (1) internal (1982), and (2) external (1983).

Comments

An agricultural economics section has been created at Chitedze station, complete with Malawi staff (including two potential M.S. degree-holders). Most of the other work plan objectives have been started or, in some cases, nearly realized. The forms of research interest of the unit appears to be concentrated much more toward addressing macroeconomic policy issues than toward addressing economic constraints faced by Malawi smallholder. Some of this tendency is natural, as most economists would be very interested in some of the economic policies unique to Malawi (e.g., the "pricelessness" of land or the price-making policies of ADMARC). However, very little can be done about many of the macropolicies in place in the GOM and, furthermore, expatriate advisors may have even less impact on such policy decisions by the very nature of their alien status.

The agricultural economics section has done a good job of collecting baseline data and filing such data in a data bank using the Apple II+ computer. While not as frequent as one would like to see, contacts and collaboration between this unit or other UF units (mainly maize breeding, livestock and FSA) have taken place. Finally, some research publications have been produced by the section, but few, if any, are relevant to smallholders.

Suggestions:

1. While many project inputs are defined as being either vehicles or heavier equipment, the "tools" of agricultural economics are often reference texts. For this reason, the evaluation team recommends that project leadership and the UF backstopping group do everything possible to quickly facilitate the importation of the list of books requested in February, 1982 by the head of the agricultural economics section.

2. Plant breeders, agronomists, plant protection specialists and agricultural research managers are not the only disciplines which require contact with international agricultural research centers. Agricultural economists need the same type of exposure, training and orientation. Thus, the evaluation team recommends that the MOA and the COP support some requests for Malawi agricultural economics staff to attend or visit such centers as IITA, ICRISAT or CIMMYT (either in Mexico or Nairobi). If such a recommendation is impossible, then the evaluation team recommends that the MOA invite Dr. Mike Collinson (or one of his East Africa staff) to again visit and spend time with the agricultural economics section to provide orientation as to adaptive, on-farm research.

3. Agricultural economists are generally better utilized by working with agronomists and other agricultural scientists and contributing in a meaningful way to experimental trials. A very good way to do this is to conduct a hands-on training workshop for research agronomists and/or extension workers to introduce economic analyses of agronomic trials via hand-held calculators. The evaluation team recommends that the agricultural economics section take the lead in setting up, arranging and conducting such a workshop to introduce economic trial analysis to research (and/or extension agronomists) adapting the methods used in the CIMMYT publication, "From Agronomic Data to Farmer Recommendations: An Economics Training Manual," to specific Malawi research (or extension) research trials.

4. Finally and most importantly, probably too much emphasis has been placed on macroeconomic policy issues by the agricultural economics section. A greater amount of time should be invested in forming interdisciplinary links between the section and (a) other UF disciplines and (b) other Malawi researchers. More attention needs to be given to the microeconomic issues these other disciplines face. Therefore, the evaluation team recommends that the section spend more time in (a) farm-level trial design and analysis of trial results, (b) determining whether or not improved treatments benefit the farmer more than they cost him, and (c) collaborating with the adaptive research effort via the FSA section. If this recommendation is followed, the realized work plan of the UF agricultural economist will begin to look more like the original job description for this position outlined in the Project Paper.

## B. Farming Systems Analysis

### Introduction

The farming systems analysis (FSA) section was one of two new sections to be instituted under the UF/USAID contract. Dr. Art Hansen, an associate professor of anthropology with UF, arrived January 30, 1981, to head this section. One of the things which this evaluation team became aware of at the beginning of the evaluation is that this project is a Malawi Agricultural Research Project, not a Malawi FSR project. Thus, the FSA is evaluated as any other section of the project would be evaluated and not as if it were the dominant thrust or philosophy of the entire project.

### Inputs

One of the UF technical assistance positions for the initial two years of this project was provided to establish and head the FSA section.

Other inputs to the project were covered in the evaluation of the agricultural economics and the training section of this evaluation.

### Outputs

The FSA section head outlines 10 project objectives in his workplan (UF/GOM/USAID progress reports). The first objective is (1) to establish a farming systems research (FSR) program. This has been done, including the appointment of five FSA staff: (1) Mr. Mwango, (2) Mr. Phiri, (3) Mr. Kawonga, (4) Mr. Bulla and (5) Mr. Ndengu.

-Problem: The last three-named staff members were selected by higher level MOA officers and without the input of the head of the section into the selection process (see the proceeding evaluation of the agricultural economics section for details). The key to successful on-farm research is a commitment to farm-level field work. With no input into the selection process, it is difficult to see how the section head could be assured candidates for his staff expressed such a commitment.

Next, the FSA section set up on an office at the Chitedze research station and began FSR. The methodology of FSR in Malawi, as expressed by an early FSA publication (Appendix 4 contains the list of FSA publications to date), is to consist of the following four steps:

"The first step is descriptive and diagnostic... the initial... stage ends with the identification of some high priority targets for adaptive research. Farming systems work is action-oriented...

"The second step... is the design of alternative technologies.... the proposed alternatives are intended to modify the existing system rather than dramatically change it.... (because) smallholders are reluctant to undertake radical changes which entail a lot of uncertainty....

"The third step is testing the proposed alternatives to see how they perform.

"The fourth step occurs when the tested innovation proves to be a good and acceptable modification of the system. At that time the proposal is handed over to the extension service." (Hansen, 9/81, pp. 5-7).

The first step, diagnostic survey, was completed in four rural development project areas between April and June, 1981, under the direction of the FSA section head. Those who participated in the survey included DAR agronomists and ADD staff. The latter consisted of extension, evaluation and various specialists. The four ADD's which hosted surveys were (1) Lilongwe, (2) Blantyre, (3) Karonga and (4) Liwonde.

After its survey, each ADD held a meeting to evaluate the results of the survey and to come to agreement on technological treatments for on-farm trials. Trials were designed and carried out in 1981-82 in Blantyre ADD (Phalombe), Lilongwe ADD, and Liwonde ADD. Shortages of petrol and staff made it impossible to work in Karonga ADD (Chitipa).

Using the Phalombe area as an example, trials were designed around the system (maize + cowpea + sunflower) and implemented in two villages on eight farms each. (Heavy rainfall eliminated two farm trials in the second village, so a total of 14 trials were harvested). Treatments were four: (1) local maize without fertilizer; (2) local maize with fertilizer; (3) improved maize (CCA composite) without fertilizer; and (4) CCA with fertilizer (at a rate of 75 kg. N/ha). The farm trials were farmer-managed with orientation (and seasonal observation) by research and extension staff from Bvumbwe ARS and BLADD. The conclusions from one season of data were: (1) variety makes little difference without fertilizer and (2) both varieties respond to fertilizer. Results were discussed both by, and with, participant farmers.

Similar methods were followed in the other two ADD's. The results are written up in several FSA section publications which are listed in Appendix 4 (especially Hansen, 3/82; 7/82; 3/81; 4/81; 8/81; and 1/82). Thus, at the end of the 1981-82 harvest, the FSA section, and various ADD's, had progressed from step 1 through step 3 of the Malawi FSR methodology. However, there are no follow-up trials in Malawi during the 1982-83 growing season. The immediate question is, "why not?", but the answer is relatively complicated and will be discussed in the following Comments.

The final activity in establishing a farming systems program was to forming links with international centers. A close link was formed with the CIMMYT/Africa outreach economist, Dr. Mike Collinson. Dr. Collinson was invited to Malawi and supervised the survey work in Liwonde ADD in 1981.

The second objective of the FSA section is to (2) establish a research/extension liaison system. The FSA section worked both in the field (at the ADD level) and at the policy level (with the CARO and ARS) to build a stronger link between research and extension. This included participation by ADD staff in the design and execution of the diagnostic surveys and the design, monitoring and analysis of the OFT's. In addition, the section met with various ADD and NRDP personnel to explain FSR and adaptive research.

The third objective of the FSA section is to (3) establish a research coordination system. The section worked on coordination between the research and evaluation units of the MOA at the national level, and explained the FSR approach at various ADD evaluation staff meetings. The section has also done survey work, with an end to refining the survey tool to better elicit information on smallholders' practices, problems and conditions. Finally, the section head has served on the ARC (Agricultural Research Committee) since 1981.

The fourth objective of the FSA section is to assure that there are (4) professional research personnel functioning at M.Sc. and Ph.D. levels. One candidate left for further training in the U.S. in December, 1982, one year behind schedule. While the second candidate has not been identified, all potential candidates for graduate study in the U.S. have now signed up to take both the GRE and the TOEFL qualifying exams.

- Problem: apparently there were delays both in GOM clearance procedures to create the first position in the FSA section and in hiring the first Malawi FSA professional. Such delays have made it impossible for either graduate school candidate to overlap with the current section head upon return from study in 1985 (or 1986). The question arises as to who will head up the FSA section between the departure of the current section head and the return and field orientation of the FSA candidates studying in the U.S.

The fifth objective is to (5) improve support staff capability. The activities of the section head in regard to support staff orientation and training have been as follows:

(a) continuous in-service training of FSA staff; (b) co-sponsoring of a multiple-cropping research conference, October, 1981; (c) sponsoring a socio-economic research conference, January 1982; (d) conducting a week seminar on design and analysis of on farm trials (OFTs), October 1982; (e) arranging for six DAR and ADD staff to attend CIMMYT-sponsored FSR courses in Nairobi, 1981; and, (f) arranging for three DAR staff to attend a CIMMYT-sponsored FSR course in Zimbabwe, February, 1983.

The sixth objective is to (6) establish baseline data (and field trials) for 110 to 130 EPA's. Surveys have been conducted in areas of the LADD and the BLADD. The data are being analyzed with an end to producing more insight into smallholder practices. On-farm adaptive trials have been conducted in villages in the BLADD and the LADD by the section, and in the LWADD by local ADD personnel. Up to the present time, less than half of the EPA's have been served by adaptive on-farm trials. The project paper goal of 110-130 EPA's impacted with baseline data and/or OFTs will be impossible to realize by the project end. Establishing local research teams in two or three pilot ADD's for adaptive research trials is a more realistic goal for the FSA section and DAR.

The seventh objective is to (7) strengthen selected research programs relevant to smallholders. The section is collaborating with both maize breeding and agricultural economics in including local maize in fertilizer response trials during the 1982-83 cropping season. To say the least, identification of local maize as (a) the predominant variety in the majority of farm cropping systems, and (b) a key treatment in the farm trials, has led to a basic misunderstanding about the role of FSR in Malawi agricultural research. (This issue will be addressed in the Comments section). While this linkage may appear to be of little importance to some, it has led to a major rethinking of maize breeding work (in collaboration with Dr. Pasley).

In addition to the diagnostic surveys and OFTs, the FSA section has conducted a longitudinal survey of development indicators in conjunction with the staff of the WIADP. The survey was carried out in the Lilongwe Rural Development Project area of the Lilongwe ADD. Information was collected on a wide variety of topics including changes in household structure and farming practices, dietary and nutritional status information, migration and off-farm employment and garden surveys. The data from this survey are still being coded and entered onto microcomputer disks. A preliminary analysis should take place before the departure of the FSA section head.

Problem: Much of these data will need further analysis to determine development trends and assess policy implications.

Although an initial analysis for immediate policy recommendations is planned, it is not clear how a more in-depth analysis will be returned to the DAR in a form usable by decision-makers and agricultural researchers. Our suggestion has been to encourage the Malawians being trained at UF to use these data in either their coursework or their thesis research as the basis for further analysis of smallholder development. However, this should not be confined to the production of papers suitable for academic journals. The participant trainees should be given experience in writing for Malawi policy- and decision-makers, and in so doing assist in bringing more of the analysis of the survey data back to the country.

The eighth objective is to (8) have research publications developed by the technical assistance team and Malawi staff. Appendix 4 contains a list of currently-available FSA section publications. There is no doubt that the FSA section has done an excellent job of producing interesting and relevant publications on a range of issues dealing with FSR in Malawi. A total of 14 publications in two years is partial proof of that. In addition, two of the publications ("Five Kawinga Farming Systems" and "Farming Systems Research in Phalombe Project, Malawi: Another Approach to Smallholder Research and Development") are excellent summaries of current farmer practices and problems in two ADD's in Malawi.

Problem: Of the 14 publications, one is authored by someone other than Dr. Hansen; another is co-authored with Dr. Hansen as the senior author; and 12 are sole-author publications by Dr. Hansen himself. In light of the fact that there exists a FSA section in the project, the evaluation team believes that either: (a) more effort should be spent developing and producing co-authored, or section publications, or (b) more effort should be made in selecting Malawian staff for the FSA section (or in-service training for the existing staff) who can contribute to the FSA publication exercises.

Otherwise, the project may face the criticism by some that the FSA section is producing publications which are the sole output (and, implicitly, contain only the ideas) of the FSA section head.

The ninth objective is to (9) see through the survey of smallholder acceptance of research product to be carried out in the fourth year of the project by UF in accordance with the PP. The pilot survey for this effort was conducted during August and September, 1982, among smallholders in the Lilongwe ADD. The results of the survey are currently being analyzed by the FSA section. The purpose of the overall survey is to measure acceptance of a representative set of DAR recommendations by smallholders. The final format for the more extensive survey is yet to be agreed upon by DAR and UF technical assistance team.

The tenth and final objective of the FSA section concerns (10) other project-related activities. The section head has been involved in various interactions with consultants and visitors to the project, and has served on a team to outline a proposed research, extension and training follow-on project for USAID.

GENERAL COMMENTS

While the above Outputs section addresses the physical and methodological outputs of the FSA section in a relatively objective and brief manner, this section will attempt to address the more subtle issues of why the FSA section is relatively isolated both from other UF technical assistance and from the mainstream DAR researchers and higher-level MOA officials. This section is necessary because the evaluators feel that the following two statements regarding the FSA section are true:

(1) In comparison to "standard" FSR methodology and procedures, the Malawi FSR approach, as exhibited by the FSA section, was extremely well carried out up to the time of harvest of the 1981-82 cropping season; while, on the other hand,

(2) Some mainstream DAR researchers, some of the UF technical assistance, and some upper-level MOA officials are either:

(a) not in sympathy with the FSA approach to FSR, or
(b) of the opinion that the FSA approach to FSR is not research.

These two statements are contradictory and need to be reconciled.

There is general agreement that the information gathered in the diagnostic phase of FSR implementation was quite helpful in assessing farmer's needs. However, problems arose when the FSA section headed the subsequent trial design phase. Some DAR officials and some of other UF research staff believe the trial design phase should have been a joint exercise, where agronomy takes the lead with FSA section assisting. Indeed, the original job description for the Farming Systems Analyst position states that one of the specific duties of the FSA is as follows: "Assist the Research Coordinator and research officers in the selection and evaluation of smallholder research projects to ensure corporation of local smallholder farming systems data into research planning." (Project Paper, ANNEX A, p. 11).

In short, agricultural scientists in general did not like the idea of a social scientist designing, implementing, harvesting and analyzing agronomic, on-farm trials.

In addition, it appears that there was very little UF team interaction between the diagnostic survey stage and the farm trial design phase. The reasons why are not too clear, but it has become apparent that the manner in which other UF technical assistance was approached (or ignored) did not help matters. Instead of assisting the rest of the team in design of trials, the FSA section head employed a more direct approach and attempted to integrate people under him instead of approaching them for professional advice. There were few alternatives, however, as the remaining DAR staff and UF technical assistance had no formal mandate to work in an interdiciplinary mode; thus the FSA section was forced to rely on recruiting voluntary assistance. The evaluation team believes that it is nearly impossible to institute a truly multi-disciplinary interaction and joint effort on a voluntary basis. The FSA section was forced into a choice between proceeding using whatever manpower and agronomic advice was available and willing to participate in 1981-82, or waiting another season to initiate on-farm trials. As the FSA technical assistance was only funded for the first two years of the five year project, delaying the trials would have meant that the objectives of the FSA workplan would have fallen far short of achievement.

Identifying the importance of local maize from the diagnostic phase was a scientifically acceptable outcome. Basing the first round of OFTs heavily on local maize varieties seems to be going counter to the GOM policy of quickly increasing per hectare yields in smallholders fields. However, everyone agrees a check plot of local maize varieties should be allowed in any OFT. Thus, local maize would have been included in any systematic set of trials, based on the information provided by the FSA diagnostic surveys. The point to be made here is not very subtle--it is simply a lack of communication. From an agronomic point of view, it is assumed by Malawi DAR researchers, based on years of experience that the improved varieties available (both composites and hybrids) are genetically superior to the local varieties in their ability to yield well under high doses of nitrogen fertilizer and good management. What the actual OFT design measured, however, during only one growing season, was the response of an improved versus a local variety using DAR-recommended levels of fertilizer in the farmer's cropping system (which, in the case of the BLADD, included both sunflower and cowpea) under his (or her) own management. Thus, the improved variety was subjected to two conditions for which it was not specifically bred.

The results are not surprising, but their interpretation is. In the first place, very few agronomists/breeders would place as much emphasis on one year's data as did the FSA section, reinforced by temporary UF technical assistance. In the second place, the MOA/DAR and other UF technical assistants misinterpreted the implications of this trial. What the results indicate is not that there are no differences between varieties, but that in that particular ADD farmer system and under the unique farmer management during the 1981-82 season, there were no statistically significant differences between varieties. Further, the importance of considering alternative sets of recommendations for different levels of farmer resources was pointed out. The whole MOA/DAR-UF research team should have used this information as a positive feedback from the farm level to refine on-station research priorities

to address the issues raised by the OFT's. They should not have reacted negatively to the results of the OFT's. Finally, the way in which the FSA section reported trial results should have been positive - "we believe more on-station work could be done on improved varieties grown in association with other crops, and perhaps more thought should be given to higher fertilizer recommendations for improved varieties than for local ones", rather than "there are no differences between local maize and the improved variety."

Once the various actors began to go separate ways, subsequent contacts because less frequent and opinions about the "others" solidified and became self-reinforcing. The FSA section viewed the OFT's as ultra-high priority and dedicated much time to them; other UF scientists had their own programs and priorities, and little inclination to visit trials into which they had little or no input; some MOA officials continued to lament the fact that the FSA section was taking the lead in agronomic farm trials.

Between the 1981-82 and the 1982-83 seasons, the decision was made by the acting CARO and the COP to put a temporary stop to the OFT's of the FSA until such a time as agronomy could "officially" be joined to the effort. This is where the matter of OFTs stands today: there is no second round of OFT's during the 1982-83 cropping season. The FSR methodology has come to a halt between the OFT "observation trial" (season one) phase and the OFT "verification trial" (seasons two, etc.) phase. The evaluation team feels that these issues should have been resolved so there could have been follow-up trials this year with the farmers in the ADD's where trials were in place last year. However, if such a pause in the farm trial phase is both temporary and positive, in that it leads to a reinstitution of communication between the FSA section and the rest of the UF technical advisors, and between the UF team and the acting CARO vis-a-vis FSR methodology and implementation plans, then the evaluation team believes there is still reason to be optimistic that the farm trial phase will resume in the next cropping season.

Suggestions:

1. We recommend that the UF team meet in the multi-disciplinary mode and sort out the group feeling toward FSR in general and the specific place FSR has in each researcher's program. Much more than lip service needs to be paid to the meaning of a multi-diciplinary meeting in this instance.

2. Shortly after such a team meeting, the UF team should meet with the (acting) CARO to reconcile any remaining differences between perspectives and views of FSR in Malawi. The evaluation team believes such a meeting should serve to deliniate and solidify the following concepts of the Malawi FSR approach:

(a) an approach should be developed for and by Malawi scientists, who will have to live with such an approach, but assisted in each step by the UF technical assistants, especially the FSA and agricultural economics sections;

(b) the FSA and agricultural economics section should want to participate in such an effort, and should be so encouraged by the remainder of the UF team;

(c) the focal point of the OFT's should remain the ADD level, and such a focal point should be strengthened by having at least one, and preferably two, Malawi DAR agronomists at that field level in adaptive, farm-level trial research. Such agronomist(s) would be a part of the ADD team, but their technical backstopping and financial dependence would be under the CARO;

(d) DAR social scientists (agricultural economists, anthropologists, etc.) should be available to work hand-in-hand with each adaptive research agronomy team; or, if manpower is short, such social scientists could be stationed in each of the three regions of the country, where they would backstop the adaptive research teams of each ADD in the region;

(e) such ADD-level adaptive research teams should be responsible to an Adaptive Research Coordinator (ARCO) who would in turn be responsible to a FSR coordinator at the national level, who in turn would report directly to the CARO;

(f) the UF technical assistance in general would backstop this ADD-level adaptive trial focus, with most backstopping needs being identified by the national-level FSR coordinator and passed along via the FSA section of the project team.

3. The evaluation team recommends that, until proven to be less efficient than an alternative system, the adaptive research trial sequence in Malawi should be encouraged to use the following broad stages:

(a) diagnostics: already done extremely well;

(b) observation trials (On Farm Trials): again, already done in some ADD's, but with too much emphasis placed on one season's results;

(c) verification trials: a stage which may vary from one to several years, depending on the amount of fine-tuning involved in each set of trials per homogeneous ecological zone;

(d) demonstration trials: these trials, 100% under the supervision of extension, are so named only when research is convinced that their recommended technological innovations are superior to and less risky than the current farm practice, as well as being non-disruptive of the social setting of the farm family.

4. The acting CARO and other high-level MOA officials should be encouraged to assist in the design of the next round of on-farm trials and, if possible, also the diagnostic stage, if a new ADD is selected for adaptive research implementation. Such senior scientists can make valuable contributions to trial design, and they can also learn something new from farmers each time they are involved in a different area of an ADD.

5. The evaluation team contends that none of the above will occur if the tendencies of the recent past -- more open dialogue between the major FSR actors -- are not immediately reinforced by taking the above recommended actions. The UF team appears to have sorted out several of its internal difficulties, and the MOA/DAR needs to seek more positive interactions with this team. All sides need to stop accusing the FSA section of being too autocratic, and the FSA section needs to see itself as a participant in adaptive research trials for the future. The evaluation team concludes that a great potential still exists for introducing the FSR approach at the ADD level, and that one of the great obstacles in the way of realizing such potential is the divergent views held as to how Malawi should approach on-farm research.

6. Finally, the team recommends that Dr. Janicki (recently arrived UF agronomist) should be assigned, oriented, trained and counted on as the FSA section agronomic advisor to FSR trial design, implementation, field observations, harvest details, and agronomic (ANOVA) analysis.

## C. AGRONOMIC CROPS RESEARCH

### Introduction:

The agronomy research program of this project was originally designed to cover the major crops produced by Malawi's smallholder farmers. According to the PP, the project emphasis was meant to provide greatest immediate benefits to smallholder production in which at least 85% of the population are engaged. With this objective in mind the technical assistance and training components of the project were to focus on maize, groundnuts, beans, wheat and sunflowers, fruits and vegetables, seed production and soil fertility evaluation and improvement.

The UF fielded a technical assistance team for agronomic crops research with certain expertise and experience meant to reflect the aforementioned priorities. The following is a list of staff (past, present and projected) with their principal areas of concentration:

(a) Darrel McCloud - Research Coordinator - Tour: June, 1980-September, 1984.
Oilseeds Section head and coordinator
Field experimentation on groundnuts

(b) E.M. Hodges - Agronomist - Tour: October, 1980-November, 1982.
Fodder and Pasture coordinator
Forage agronomy and production

L.W. Janicki - Agronomist - Tour: January, 1983-September, 1984.
Proposed area maize agronomy/adaptive on-farm trials

(c) I.B. McLean - Horticulturalist - Tour: August, 1981-May, 1982
Plan of work not implemented (fruit and vegetable research) because of early departure.

C. Arnold - Horticulturalist - Proposed tour (pending approval) April, 1983-September, 1984.

(d) S.F. Pasley - Plant Breeder - Tour: September 1981-September 1983.

Head and coordinator of Maize Breeding Section.
Head of Wheat Section.
Main activities to date: maize varietial selection and agronomy.

MAIZE AND WHEAT

The project work plan lists the following verifiable activities for these crops:

MAIZE:

(a) Breeding programs established in all major agro-climatic zones.

(b) Suitable varieties and production practices identified for all major agro-climatic zones.

(c) Working relations established with International Agricultural Research Centers (IARCs) and national research centers of neighboring countries.

(d) Work with Agricultural Economic Section to determine plant nutrient production functions.

(e) Work with FSA Section to identify constraints to production and design alternative technology.

(f) Low cost input studies developed and initiated.

WHEAT:

(a) Trials established in all major agro-climatic zones to identify adapted varieties and to develop/identify optimum production practices.

(b) Working relations established with IARCs and neighboring country research centers.

Dr. Pasley, the UF plant breeder, has only been in-country about 16 months and has been given a very heavy workload in addition to the maize breeding and maize and wheat agronomy responsibilities. The evaluation team commends Dr. Pasley on the overall progress his section has made in meeting many of the objectives of his program. Given the importance of maize to the Malawi smallholder, efforts should be made by the DAR and Chief of Party to ensure that Dr. Pasley be allowed to devote full time to his research work.

In respect to establishing working relations with IARCs, Dr. Pasley has worked closely with CIMMYT, IITA and ICRISAT for the exchange of breeding materials. Dr. Pasley has visited the national crop research centers of Zimbabwe and Kenya to establish working relations and arrangements for the exchange of research information and breeding materials.

According to Dr. Pasley, the maize and wheat research section is involved in a large number of trials including the following:

(A) Breeding and Varietal Selection:

1. National maize variety trials (low altitude - 3 sites; high altitude - 3 sites)

2. CIMMYT trials (International trials - 3 sites and elite trials)

3. Top Cross Population Selection (3 sites)

4. UCA and CCA open pollinated composite improvement and selection

(B) Maize Agronomy

1. Spacing and plant population (5 sites)

2. Nitrogen Fertility Trial (8 sites)

NOTE: This trial compares local maize lines with improved adapted varieties on farmer fields. The World Bank has requested that information on the economic optimum response of improved adapted varieties to nitrogen fertilizer in each major agro-climate region be provided. This information was not available from past research data. It should be noted that this series of trials was designed in collaboration with the Agricultural Economics section and will be used to establish a response curve.

3. Phosphorus fertilizer response trial (1 site)

4. Potassium fertilizer survey trials (4 sites)

5. P and K fertilizer trial (1 site)

6. Time of weeding trial (1 site)

(C) Wheat Agronomy (Proposed to begin March 1983)

Emphasis is being placed on identifying suitable varieties for each growing region, determining optimum planting dates and seeding rates, and intercropping wheat in maize in order to make better use of available soil moisture. (Source: October - December 1982 Quarterly Report).

Comment: The UF plant breeder and cooperators throughout the DAR station network have responsibility for maize and wheat research in Malawi. A major emphasis was placed on reducing the number of trials to save money. For example, in the previous year, 44 maize trial sites were located in the Lilongwe District alone. The number has been drastically reduced for the current season. Major emphasis appears to be placed on developing improved varieties for the marginal Lakeshore and Shire Valley areas.

The agronomic work now underway has begun to answer the questions relating to fertilizer use and maintenance of soil fertility.

It is the opinion of the evaluation team that the Maize Research Section has made substantial progress in establishing priorities and organizing and directing their research program to fit the supposed needs of Malawian maize producers. Given the large number of different trials and sites, it would appear that Dr. Pasley is not able to personally visit and monitor all the trials. Dr. Pasley indicated that he must largely depend on Professional and Technical Officers to carry out the majority of the work. Also, the increased load created by expansion to include agronomic trials has diluted his time and efforts on breeding.

Moreover, we note that the maize research section is charged with identifying smallholder constraints to maize production and conducting low cost input studies, we believe these are not adequately covered in the current research program due to lack of resources and personnel. To our knowledge only the nitrogen fertilizer trials are located off-station.

Suggestion:

1. Because of the importance of maize to the smallholder, and given the size of the large maize breeding effort underway, we would suggest that additional professional staff be given to the maize program. We would suggest that Dr. Janicki assume a large portion of the crop agronomic work in conjunction with his proposed assignment to the FSA Section. This would allow the plant breeder to devote a larger portion of his time to plant breeding, specifically, to maize.

2. We would suggest that maize (and possibly other crop) trials be used more as a training device. If the various trials are planned well in advance, the Malawian maize agronomists could be pulled together for a short training session during which the design of the trials is explained and a degree of participation encouraged from this level of staff. The staff input concerning past field experience and local problems would improve the planning of the trials and field staff might demonstrate more responsibility in conducting field trials.

3. According to our information the Malawian maize breeder now in long-term training will return in December 1983. In order to maintain the impetus of the maize breeding program, project technical assistance should be made available for the LOP in order to allow continuity of effort.

4. On-farm field trials with maize on agronomic problems need to be initiated with the FSR section as soon as the program has developed sufficiently. The experience already gained from the first round of on-farm trials will provide a background.

5. Fact sharing trips to International Agricultural Research Centers and neighboring countries' crop research centers to review national maize breeding programs and other agricultural research programs should be continued, especially after the return of the Malawian plant breeder from long-term training.

PASTURE AGRONOMY

The UF filled the agronomist position with E.M. Hodges, pasture agronomist, whose tour of duty extended 25 months up to November 1982 (departed prior to evaluation).

The project work plans list livestock/pastures activities together. There are not separate verifiable activities for pasture. However, field trials with forages are listed as planned activities.

Dr. Hodges' individual work plans list the four following activities.

(a) Increase the genetic base of species available for fodder and forage production.

(b) Evaluate the effect of site and management practices on production and utilization of forage species.

(c) Investigate Leucaena as a source of protein for livestock production.

(d) In cooperation with the livestock specialist, establish pastures at Chitedze, Mbawa, Lunyangwa and Chitala research stations. Chitedze pasture will be the site for controlled grazing experiments (discussed in livestock output). The purpose of the trial is to "measure the production of three grasses and one legume-grass combination in terms of beef production".

The following list of forage trials and activities conducted by Mr. Msiska (pasture agronomist) and Dr. Hodges were gleaned from the quarterly reports and end-of-tour report:

(a) Setaria local accessions - response to harvest frequency;

(b) Grass-legume variety combinations - competition trial (2 seasons);

(c) Legume-Buffel grass compatibility trial;

(d) Legume-Guinea grass compatibility trial;

(e) Leucaena stubble height/value of Leucaena for feeding (3 seasons);

(f) Grass and legume nursery;

(g) Promising grasses - replicated harvest trials (2 seasons).

Other Activities:

(a) Collection of indigenous forage plants in the northern districts of Malawi (activity directed by H. Msiska).

(b) In cooperation with Farm Machinery Section, obtained the Norris Christy pellet mill (originally used by FAO) and set it up at Chitedze. Leucaena leaf was harvested for use in livestock experiments; and cooperated with Farm Machinery Section and National Seed Company in pelleting leucaena for exploratory export.

(c) Updated the publication "Pasture Handbook for Malawi" to be used by extension.

(d) In December, 1982, a pasture research program was begun in Mzuzu ADD by Dr. Gray and Mr. Msiska. Plans are to establish several trials on-station. In addition, on-farm trials will be conducted on 10 representative smallholder dairy farms.

Comments:

The forage agronomy program of Dr. Hodges and Mr. Harry Msiska covered the classical aspects of pasture research and seem to meet the author's plan of work. However, there seems very little effort to identify problems and constraints of the smallholder dairy farmer or beef stall-feeder. The exception is the newly established (December 1982) pasture demonstration and program in Mzuzu area by Mr. Msiska and Dr. Gray which will serve as a good extension effort and will test DAR recommendations. The economic considerations are not covered, however.

It is the opinion of the evaluation team that there is potential for on-farm adaptive trials in the field of pasture agronomy through cooperation with ADDs that are encouraging beef stall-feeders and/or crossbred dairy schemes. Both of these programs currently require the farmer to plant improved pastures before he/she receives credit to establish the unit.

Suggestions:

1. Greater emphasis should be given to working with Livestock Extension personnel to identify the more immediate problems constraining the expansion of the beef-stall feeding and dairying operations and include these problems in the research program.

2. The livestock specialist and Mr. Harry Msiska should participate with the FSA and Agricultural Economics Sections to design and implement appropriate on-farm trials in pasture establishment and maintenance.

D. HORTICULTURE

The production of horticultural crops by smallholders has been recognized by the project as a means of increasing farm income and nutrition. Research was intended to improve the production of more than 30 vegetable crops and 25 or more fruit crops.

The horticulturalist position was filled briefly by Dr. I. B. McLean from August 1981 to May 1982. At present the position remains unfilled, however, approval is being sought for Dr. C. Arnold. Detailed work plans have not been developed as the position is not yet filled.

Given the time remaining in this project, the evaluation team doubts that the desired outputs for the horticulture research will be accomplished. With only 19 months remaining in the project, it would appear that the most important horticulture work that can be done would be to assess and consolidate the present horticultural research activities and prepare a longer term plan for consideration in any follow-on project.

Suggestions:

It is the opinion of the evaluation team that the horticulturalist position should be filled immediately with a senior person experienced in horticultural production and of broad enough experience to cover vegetable, fruits and tree crop research programs. Additional technical assistance could be provided on a short-term basis as needed. The workplan for the long-term horticulturalist should concentrate on improving the use of existing facilities and consolidating the nurseries and plantings throughout the country. A limited number of vegetable trials could be organized and implemented by POs and TOs with supervision and assistance from the expatriate horticulturalist.

## E. LIVESTOCK RESEARCH SECTION

### Introduction

The Livestock Section of the Department of Agricultural Research was probably one of the weakest of the on-going research programs when the project commenced. Dr. Richard Gray (Ph.D. in Animal Husbandry) arrived in September, 1981 to head this section. Presently, in addition to Dr. Gray, the section has the following Professional Officers:

Mr. A. P. Mtukuso - Small Ruminants/Poultry and Beef
Mr. Kumwenda - Dairy Production
Mr. Kasowanjete - Animal Breeding (Presently assigned as Manager of Dzalanyama Ranch)
Mr. Zimba - Reproductive Physiology

The professional research staff is complemented by about twelve research technicians, six of which are located at Chitedze and an equal number assigned to various other stations. Four technical assistants' slots were approved but have not been filled. The Livestock Section works closely with the Pastures Section, which at present has only one PO (Mr. Msiska), four research technicians and one post presently unfilled. The intended heads of both the Livestock and Pasture Sections are project-funded participants pursuing Ph.D.s. Mr. J. Munthali (Livestock Section) is studying animal nutrition with a minor in agronomy (pasture management). Mr. B. Dzowela (Pastures Section) is studying agronomy with emphasis on pasture management and a minor in animal sciences (nutrition).

In addition to technical assistance and training, the project is providing equipment for a feed and forage analysis laboratory which will permit determination of protein, energy and mineral content of common forages and fodders and the nutritive value of forages by *in vitro* techniques.

The work plan developed by Dr. Gray covers the duties specified in the scope of work contained in Annex A of the PP and breaks down broad responsibilities into discrete tasks that are manageable and against which progress can be assessed. The evaluation team believes the work plan appears to be highly ambitious considering the available human resources to carry it out.

The first objective of the work plan is to strengthen research programs in areas relevant to smallholders. Pursuant to this objective, several research activities in dairy and meat production have been developed and initiated:

(a) Calcium and phosphorous supplementation for dairy cattle (initiated 6/82 - duration: 3 years).

(b) Crossbreeding Sahiwal and Friesian/Zebu cross for a dairy animal more resilient under traditional management practices (initiated 12/82 - duration: 10 years).

(c) Comparison of four feed concentrates (protein) for milk cows (initiated 10/82 - duration: 3 years).

(d) A comparison of zero grazing and grazing management systems for smallholder dairying (initiated 12/82 - duration: 3 years).

(e) Dry leucaena and groundnut tops as protein source and roughage in stall-fed beef cattle (initiated 11/82 - duration: 3 years).

(f) Evaluation of crossbreeding Malawi Zebu, Friesian, Brahman and Boran Breeds (initiated 1979 - duration: long term).

(g) Determine sown pasture productivity in terms of animal performance (in conjunction with Pastures Research Section).

(h) Test and demonstrate methods of establishing improved pastures for small-scale dairy operations (in conjunction with Pastures Research Section).

In addition to the above-noted research activities which have been initiated, it is planned to initiate several other research activities during 1983, some in conjunction with the Faculty of Bunda College. The planned activities cover breeding and animal nutrition, research for small-scale dairy and beef operations, goat, sheep, poultry and swine production.

Concurrently, the section is presently involved in (a) developing a plan to relocate beef cattle breeding research from the Dzalanyama Ranch to other research stations; (b) trying to initiate a Task Force to study the relationships among the Livestock Section of the Department of Agricultural Research (Livestock and Pastures Sections), the Department of Animal Health and Industry and the Department of Agricultural Development, with the aim of developing a plan for a coordinated working relationship among the three groups, and (c) developing long range plans for research programs in each major animal species.

A second major objective of the work plan is the procurement and setting up of the feed and forage analysis laboratory and training research personnel in the proper use and maintenance of the equipment. Most of the equipment has been delivered and operations could begin as early as July 1983. The reorganization of the Department of Agricultural Research under consideration has temporarily halted the installation of the lab equipment, as the site may be in question.

A third major objective of the work plan is the establishment of computerized record keeping system for the livestock section and statistical analysis capability for the station trials. An Apple II+-computer has been procured and programs for the statistical analysis have been developed. Putting breeding records on the computer has begun.

A fourth objective to be accomplished under the workplan is developing a research activity in conjunction with the Agricultural Economics Section, to measure smallholder performance and recommend improvements for the stall-feeding of cattle. As a study done in 1982 by the WIADP treats this same subject, the Livestock Research Section is examining the need to undertake the planned study or whether adequate information can be pulled from the earlier study.

Staff recruitment and development is the fifth objective of the work plan. Staff recruitment for the 6 newly created positions has been extremely slow and only recently have two Professional Officers been assigned to the livestock research staff. One long-term participant is presently studying for a Ph.D. at the UF and expected to return in late 1983. The Livestock Research Section is proposing to send an additional three candidates for M.S. degrees in 1983. Training will be (a) Livestock Management and (b) Reproductive Physiology and (c) Dairy Cattle Management. One candidate has been selected. Other training opportunities for research staff have been (a) informal, on-the-job training and (b) short trips to research facilities in neighboring countries and to international Agricultural Research Centers. All POs have benefited from such training except those most recently arrived.

The sixth major task included in the work plan is issuing research publications. Existing publications are being reviewed by the Livestock Research Section and several revisions are underway. However, most publications or revisions of existing publications must await the results of the research program being initiated.

The seventh and last major responsibility included in the work plan is other project-related activities, which include orientation/familiarization, administrative functions while serving as the head of the Livestock Research Section, briefing visitors and serving on various committees. Dr. Gray was also given responsiblity for the project's commodity procurement, which has occupied a considerable amount of his time.

Comments and Suggestions:

Livestock research commonly has a period of investigation of 3-5 years and sometimes longer. Therefore continuity is critically important in any livestock research program. A considerable effort has been put forth to revive a rather neglected research division. Given the long term nature of livestock research, it is regrettable that a series of research priorities were not clearly established between the DAR and the Veterinary Department early in project. In the absence of such objectives, the Livestock Section appears to have established a series of research activities which will generate conclusive results in 3 - 5 years. It should be noted that the results of most of the research activities will reflect station management practices rather than farm management conditions and thus may require several years of adaptive testing before they are widely applicable to smallholders.

Secondly, the research being undertaken emphasizes dairying and beef production. While these are clearly priorities of the GOM, only about 10% of Malawian smallholders normally own cattle and a substantially larger percentage of smallholders own various small ruminants (primarily goats) and poultry. In this respect, the efforts to commence research programs on small ruminants, poultry and swine in conjunction with Bunda College seem especially important and should be pursued quickly.

Thirdly, the types of research activities being planned appear to be developing "station-bound" researchers. The heavy research workload and the small staff probably contribute to that effect. A well equipped laboratory, while justified, may have the unintended effect of reinforcing the station preoccupation of livestock and pasture researchers. The pasture/forage researchers working with small scale dairy operations to improve pastures and forage crops is a striking example of the rather immediate impact researchers can have. Such efforts should be encouraged and expanded, hopefully in conjunction with the Agricultural Economics and FSA Sections of the DAR.

Fourthly, the workload of the research activities which have been started coupled with that planned appears rather large given the Section's small staff. The situation will grow worse if the remaining professional staff is sent for long term training. It appears that the DAR must immediately recruit several (a minimum of 2) new PO's so that they can provide some continuity in the on-going research program. If new staff cannot be recruited, serious consideration should be given to postponing some of the planned training or cutting back on the research program.

Finally, several factors are converging which make it imperative to do some long-term planning for livestock research. A pressing concern is the physical placement of the laboratory equipment. A second concern is relocating the Malawi Zebu beef cattle herd from the Dzalanyama Ranch to other facilities. A third concern is the planned restructuring of the DAR and how a restructured DAR livestock research program can better serve the needs of veterinary services. The recent request by the head of the Livestock Research Section to establish a Livestock Task Force seems urgently needed and should be given priority attention by the CARO of the DAR.

## F. OTHER OUTPUTS

### GROUNDNUTS:

This crop is recognized to be extremely important to the smallholder as a cash and subsistence crop although recent production trends are toward downward.

The project has greatly benefited from the expertise and experience of Dr. D. McCloud who, in addition to his COP and coordinator responsibilities conducted some significant research on groundnut physiology.

The vertifiable activities from the project workplan for groundnuts list the following activities:

(a) Physiology of plant growth studies initiated
(b) Plant nutrient studies initiated
(c) Plant growth regulator studies initiated

Dr. McCloud, serving as groundnut coordinator and principal researcher, began the physiology of groundnut yield experiment in December, 1979 before the UF contract was signed. Funds to support this experiment were donated by Center for Tropical Agriculture, University of Florida. The major conclusion after two years data is that the popular confectionary nut Chalimbana has a low partitioning of photosynthate between vegetative matter and pods. This is thought to indicate a good probability of improvement through plant breeding.

Plant nutrient studies on magnesium were conducted in 1980 but terminated after one year when it was apparent there was no response to magnesium. Current research testing plant growth regulators and further physiology of yield experiments on new varieties are now underway.

### Suggestions

The evaluation team believes that the groundnut research to date is significant in pointing to the urgent need for selection and breeding work. However, with the recent arrival of a team of long-term groundnut researchers (including a groundnut breeder) from ICRISAT, it would appear that the needed selection and breeding research will commence shortly. Further, it should be noted that the project intends to bring back the Malawian groundnut breeder during his traning program to evaluate breeding materials for Malawi. Additional assistance may be provided by the UF project team, if it is required.

### BEANS

Project support for the bean research efforts of the DAR, centered at Bunda College of Agriculture has been limited to construction of a field laboratory and greenhouse (discussed under input section). The crop science research faculty of Bunda College headed by Dr. Edje, is well trained and has

established strong professional relationships outside of Malawi. Dr. Edje has a unique relationship to DAR, being the Bean Coordinator while employed by the Ministry of Education at Bunda College. Research is conducted at Bunda as well as on-station and in ADDs. DAR does give assistance to his program by providing labor, fertilizers and other in-kind inputs. This informal relationship has seemed to work fairly well in promoting limited bean research but the evaluation team was informed that there are serious financial constraints on research funds from Bunda College. The evaluation team was pleased that there appears to be a good informal relationship between DAR and Bunda.

Suggestions:

(1) The evaluation team recommends that the UF/USAID project management investigate the feasibility of allocating of some project funds to qualified and interested scientists at Bunda College for research. The purpose would be to allow expansion of relevant research by selected Bunda staff and to put to further use this trained manpower resource. We perceive that this relationship between DAR and Bunda could be expanded to cover other areas such as animal nutrition and soil science.

(2) Both informal and formal professional linkages between DAR and Bunda staff should be strengthened and encouraged. This could lead to technical backstopping for professional officers in DAR in areas where its own expertise is limited.

SOIL FERTILITY EVALUATION AND IMPROVEMENT

The project is supplying inputs to DAR in equipment and construction to upgrade the soil testing laboratories at Bvumbwe and Chitedze research stations. Also to be provided is short term technical assistance in soil fertility and participant training in soils. Specialized training in maintenance of laboratory equipment is included for Technical Officers.

Comments: This increased capability of the soils unit will serve the crop/horticultural/livestock production researchers of DAR and NRDP. With construction and procurement now underway, the training and short term consultancies needed to put these laboratories into full operation will soon be required. It is well known that often valuable and expensive equipment is underutilized in the developing world due to lack of training in use and lack of maintenance.

Suggestions:

That soils section Professional Officers, UF and USAID determine the needed technical assistance and training input to get the new soils laboratories into full operation as soon as feasible. This activity, in the opinion of the evaluation team, should be given high priority.

## IV. ASSESSMENT OF PROJECT PURPOSE

### A. Introduction

The purpose of this project is to strengthen the capability of the Department of Agricultural Research to provide economically sound and socially acceptable research for smallholders' needs in satisfactory quantity and quality and in a form which is readily usable by the technical staff which supervises and backstops extension agents. In assessing the progress which has been made toward this objective, the evaluation team identified three critical aspects of the efforts which have been put forth to date. The aspects which were assessed are:

1. Are the research programs being implemented technically sound, relevant to smallholders' needs and conducted in a coordinated manner?

2. Is a research management system in place which efficiently allocates financial and human resources in accordance with research priorities?

3. Is there an adequate research information dissemination system which provides research results to the appropriate clients of the research organization?

The evaluation team believes that if the above questions can be affirmatively answered, then the project is well on the way to achieving its purpose. It should be noted that the above conditions have been stated differently than originally contained in the PP. We have tried, however, to retain the intent of the PP. Numerous other indicators of achievement of the project purpose were also listed on page 14 and 15 of the PP (d through j). It is the consensus of the evaluation team that these are project outputs, and we suggest that the PP be revised to reflect this.

### B. Assessment of Research

Are the research programs being implemented technically sound, relevant to smallholder needs and conducted in a coordinated manner?

The previous section discusses technical quality of research being conducted and concludes that the research program being conducted appears to be technically sound.

The previous section of this evaluation report also discusses the relevance of the on-going research to the needs of the smallholders. In general the research being conducted does focus on the crops and livestock commonly produced by smallholders. However, some of the research being conducted may not adequately take into account the actual conditions and limitations faced by smallholders. To insure that such conditions and limitations are taken into account in designing and conducting research programs, we suggest closer coordination between the FSA and Agricultural Economics Section and the commodity programs. We also suggest increased use of on-farm trials as a means of increasing contact between researchers and farmers and between researchers and extension staff.

In the opinion of the evaluation team, a functioning reasearch coordination system has two basic aspects: (1) internal coordination among programs and (2) external coordination with extension organizations and with planning and policy making bodies.

In terms of internal coordination, we note that the FSA and Agricultural Economics Sections have been established by the project to provide some of the desired coordination. While recognizing that both these sections have relatively small staffs, we would suggest that they be given a larger role to play, especially in establishing commodity research priorities, designing research activities and in conducting adaptive trials or tests. Secondly, the evaluation team believes that it would be useful to increase staff involvement in the planning of research programs. This could be achieved through annual planning workshops where the staff of a research section or related sections meet and discuss research to be conducted for the next growing season. We believe such measures would be an excellent training device, would promote team spirit and give a sense of responsibility to field staff toward conducting quality research.

In terms of external coordination, the team does recognize the considerable effort that has been made to improve interaction with extension organizations. We, furthermore, believe that the proposed restructuring of the DAR will improve coordination with extension services and development planning divisions. The recent reorganization within the MOA places added emphasis on the need for research to take a more active role at the ADD level, as it is anticipated that ADD Programme Managers will increase their contribution to national planning. The Agricultural Economics Section has made some contributions to national-level policy analysis, and it is anticipated that such contributions will continue on a limited basis, though the major effort should be at the micro level.

C. Research Management

Is a research management system in place which efficiently allocates financial and human resources in accordance with research priorities?

A major problem which the Project Paper identified and sought to correct was that much of the research being carried out by the research organization was not relevant to the needs of the Malawian smallholders. Thus, the project was to provide assistance to (a) analyze research needs of the smallholder, (b) assess and evaluate available resources, (c) establish research priorities and (d) develop a system of allocating available resources according to research priorities. The resource allocation system in effect at the time that the project was designed, and which is still in effect, allocated resources primarily according to past trends in expenditures and the availability of external resources (primarily donor financing). Budgetary allocations were made to each research station and not to each research program, although there is an general association of research programs with particular research stations. Research station directors were then responsible for allocating financial resources and the common labor pool to various research activities.

An improved research management system was not defined in the Project Paper, rather the project implementation team was tasked with developing such a system. The management system to be established would essentially allocate funds and staff according to (a) established research priorities and (b) actual progress being made toward research objectives. To date an improved management system has not yet been defined, although there has been some notable progress toward that end. Most of the changes in the research management system have been incremental and rather independent of each other. The major modifications are discussed below.

1. The most important change has been the realization that the present research structure is not functioning properly and a restructuring of the research organization is being planned. The organizational restructuring being proposed will emphasize the various research programs instead of the individual research stations. New management procedures including the identification of research priorities, the selection and approval of research programs and the allocation of research resources are being prepared. The project-funded technical assistance has been very much involved in the development of the plans to restructure the research organization.

2. During the past budget cycle, the DAR has tried to factor the anticipated workload and resource requirements of the various research stations into the decision of the allocation of funds between research stations. Estimates were made of the number of trials to be conducted by each station and then a portion of the overall available financial resources were allocated accordingly. While the overall percentage of the budget allocated according to planned workloads remains small, it has encouraged researchers and research station managers to begin restructuring their budget requests.

3. The DAR has tried to review past budgets and expenditures and determine past research expenditures by research program. Given the present accounting procedures, this exercise has proven to be both extremely time consuming and of limited usefulness as only a small percentage of the station's expenditures can be identified as being used for a specific research program. The need for such accountability is clearly recognized by research management, but this particular exercise has been abandoned for the time being.

4. The UF team members who are acting as heads of various research sections are individually tasked with the development of research priorities for their respective sections. For the most part, section-specific research priorities have been established. The major shortcoming, however, is that such priorities have yet to reflect (a) the needs of the smallholders and (b) national development priorities. It was expected that multidisciplinary interaction through the Farming Systems Analysis Section would determine the research needs of smallholders, and that interaction and coordination with the extension system would also identify priorities both of small farmers and regional or area-specific research needs. Thirdly, while not specifically discussed in the Project Paper, it was assumed that certain national research priorities would be established jointly between the DAR and the Planning Division of the Ministry of Agriculture.

The degree to which the priorities established for the research sections headed by UF team members reflect smallholders' needs is variable, but in

general, the degree of professional interaction between commodity research divisions and the FSA and Agricultural Economic Sections is disappointing, specially in terms of establishing research priorities. It is, however, clearly recognized that coordination between research sections to develop long-term research priorities is an extended effort and cannot be expected to take place over two growing seasons. Furthermore, the proposed creation of adaptive research teams at the ADD level may provide a suitable mechanism for factoring the needs of small farmers into the agricultural research priorities. The proposed restructuring and the creation of adaptive research teams at the ADD level should also serve to strengthen linkages between research and extension. At the time the evaluation team was in-country, the proposed restructuring plan, was not yet fully formulated in terms of the organizational linkages at the national level between extension, development planning and research, especially concerning procedures for setting macro-level research priorities. The evaluation team believes that the need for such coordination is amply recognized and as the restructuring plan is developed, adequate attention will be given to resolving these problems.

In sum, the research management system presently being used is only a minor improvement over what was in effect at the time the project was designed. At present, a much more generalized awareness of the problems of the present management system is evident. Considerable effort has been made in conceptualizing, in operational terms, how improvements in the research management system can be made. It would appear that the expectations perceived today are much more fundamental and go well beyond the expectations at the time the project was designed. The major negative factor is that the duration of the present project is too short to insure the proposed changes in the research management system will be implemented.

D. Research Dissemination

Is there an adequate research information dissemination system which provides research results to the appropriate clients of the research organization?

It should be noted that this indicator of purpose achievement was changed considerably from what was originally intended in the PP. The evaluation team believes that the development of a research information dissemination system would be much more indicative of purpose achievement than mere publication of 10-20 reports.

As indicated in the preceding section of this evaluation report, several of the research sections supported by the project are publishing results of studies and research which have beem conducted. Many of the publications are intended for use by various extension programs but occasionaly, and perhaps increasingly, publications are aimed at planning divisions and policy makers as well. Two recent cases are cited as examples: (a) the Maize Agronomist and Agricultural Economics Sections were requested to analyze past trials and determine if area-specific fertilizer recommendations could be made and (b) the Agricultural Economics Division was requested to estimate the probable impact on maize production of removing the fertilizer subsidy. The evaluation team would suggest that, in the future, the DAR may wish to consider informational services which can be provided routinely or on an ad hoc basis

to the planning division, marketing organizations or policy making bodies. We believe however, that the main focus of this project should continue to be providing relevant information to the extension service. We have stressed repeatedly throughout this evaluation the need for coordination between research programs and believe that this coordination is equally applicable for publishing and distributing research results and recommendations. The project may wish to begin experimenting with having several sections jointly draft research recommendations. For example, joint publications may be drafted by the Livestock, Pastures and Economics Sections on promoting dairy or beef production schemes. In due time, various research recommendations may be collectively published according to particular farming systems. While no major recommendations are immediately available for publication, we would suggest the DAR consider and experiment with multidisciplinary releases of information and accustom research staff to such an exercise.

## V. PROJECT MANAGEMENT

Generally in AID projects, the major project management functions are to insure that project inputs (commodities, technical assistance, training opportunities, etc.) are properly procured, delivered in a timely manner and used in a manner which will insure that the specified outputs ascribed to the project are forthcoming. Secondly, project management must continually monitor the development of the project outputs and insure that the outputs are being realized in a manner which will insure the purpose of the project is achieved.

The description in the PP of the project management arrangements anticipated for this project are extremely general, indicating that project management functions will be shared in close collaboration between the GOM and the Title XII University and that AID's role will only be to monitor, evaluate, advise and approve critical actions. The system that has evolved since the inception of the project is diffuse and remains rather vague.

Compounding the problem of uncertainity of specific responsibilities, there appears to be some disagreement between USAID, the DAR (GOM) and UF about whether the primary objective of the project is to (a) provide training, equipment and physical facilities, (b) build a research institution or (c) produce research results. The lack of agreement concerning the fundamental objective and the lack of a clear assignment of responsibilities have given rise to occasional misunderstandings which have hindered the implementation of the project. More importantly, the two factors have left the project without effective leadership and a clear sense of direction.

As discussed earlier in this evaluation report, the financial management arrangements for the project are also diffused. The Chief of Party (COP) for the UF clearly has responsibility for the management of funds in the UF contract for the locally procured commodities and services. Management of these contract funds is shared with the DAR and approved after the fact by USAID. Orders for commodities procured in the U.S. by the UF are approved in advance by the DAR and USAID. The reimbursement of recurrent costs is handled between USAID and the DAR with the involvement of UF only in the sense that the COP is consulted in the overall budget preparation for the DAR. Though established approval procedures are apparently adequate to insure against the

misuse of project funds, the financial management system for the project does not permit the UF, USAID and the DAR to jointly and periodically meet and plan future actions and budgetary implications of desired courses of actions. Furthermore because of the number of actors involved the financial management system (USAID and AID/RFMC, the DAR, UF-COP and UF Home Office), it is impossible to assess the project's financial position with any degree of accuracy.

With little project direction and limited opportunities for joint planning and budgeting, the project lacks flexibility to make adjustments. These are necessary in the course of project implementation and have largely caused or aggravated the numerous problems noted in the earlier discussion of project inputs and project outputs. Clearly, a more coordinated approach to project management is needed. The bulk of funds available for this project has been earmarked for specific purposes but there is some need at this time for a few budgetary revisions. A significant number of questions regarding the delivery of some project inputs warrant consultation between the UF team, the DAR and USAID. Specifically, consensus needs to be reached on the types of technical assistance (both long and short term) needed for the remainder of the project, additional training requirements and possible sources of funding and reprogramming excess funds which may be available from the budget line item for AID recurrent cost support. We would also strongly suggest that in the design of future AID projects in Malawi more attention be given to developing appropriate project management systems which will provide better project direction and improved project performance.

## VI. PREVIOUS EVALUATIONS AND AUDITS

The Malawi Agricultural Research Project was evaluated in November 1981, just as most of the long term technical advisors were arriving at post.' This evaluation concluded that the projecting was making satisfactory progress and should be continued with little or no modification. The major factors identified which had impeded progress at that time were:

(a) Delays in equipment purchases and in preparations of work plans by the UF;

(b) Inadequate support of research (specifically the assignment of research and support personnel to the project) by the GOM; and,

(c) Delays in completing contractual arrangements for the provision of technical assistance, etc. by AID.

The evaluation report recommended that:

(a) Greater efforts be put forth to increase the quantity of in-service and in-country training for Malawian research staff. (Recommendations 7, 8, and 9);

(b) The anticipated commodity procurement and construction activities should be completed as rapidly as possible (Recommendations 12 and 13);

(c) The scheduling of technical assistance inputs should be better planned in advance, and closer monitoring and guidance of technical assistance inputs were needed. (Recommendations 15, 16, 17, 18, 19, 20, 21 and 22); and,

(d) The GOM/DAR should provide the needed research and support staff and begin planning the positions that returning trained Malawian participants would fill.

(e) Consider upgrading library facilities of the DAR.

Most of the recommendations of the first evaluation had been acted upon as of January 1983, at least to a minimum degree of acceptability. There remain a number of research staff positions which still have not been filled. The UF team has planned commodity procurement, placed orders and has prepared detailed work plans, albeit somewhat slowly.

An audit of the project was conducted in November, 1982 by the Regional Inspector General's Office located in Nairobi, Kenya. This audit, entitled "The Malawi Agricultural Research Project is an Example of the Difficulty AID Experiences in Getting a Project Started," reached the conclusion that progress to date (11/82) was adequate but fell short of the planned targets.

The audit report found that:

(a) There is a need to have greater regional interchange among AID-financed agricultural research projects in Africa, especially those having similar strategies and objectives;

(b) The technical assistance component needed to be synchronized with the long-term training component to insure a reasonable overlap between returning trainees and AID-funded expatriate researchers;

(c) The extension capability needed to be strengthened to better disseminate research results;

(d) The University of Florida needed to improve the quality of individuals selected for long term technical assistance positions and prepare team members better for their assignment to the project.

(e) The management of short term consultants needed to be improved;

(g) Greater control was needed over monetary advances made by the project, and a host country contract for construction services was not in full compliance with AID regulations.

Again, most of the recommendations put forth in the audit have been acted on, at least those specifically related to modifying the present project's performance. Work plans, reporting formats and schedules have been improved and appear acceptable. Other recommendations made by the auditor require longer timeframes to bring them to full realization, but progress is being made to incorporate such recommendations into this project.

In sum, it would appear that the three key organizations involved in the implementation of this project (USAID/Malawi, the DAR and the University of Florida), have been responsive to past evaluations and audits and have made adjustments in the implementation of the project as has been suggested.

## VII. CONCLUSIONS AND RECOMMENDATIONS

### Conclusion 1

In general, the evaluation team believes that the project has and will continue to make considerable progress in strengthening the DAR's capability to conduct sound and relevant agricultural research. The long-term training program will substantially upgrade the quality of research which the DAR is capable of conducting. On-the-job training and periodic training courses should improve the quality of data collection and analysis. Secondly, the institutional evolution of the DAR has, in the opinion of the evaluation team, exceeded the expectations of the project as designed and holds considerable promise for increasing the relevance and effectiveness of research conducted in Malawi. Coupled with the institutional evolution of the DAR, the evaluation team believes that the project has been instrumental in, at least, creating an awareness of the need for a more comprehensive and coherent national research policy and hopefully can contribute to defining and adopting such a policy or set of policies. It is also apparent that the project has increased the sensitivity of research managers to the need and capabilities of smallholders and we believe that future research efforts will take this concern into account in establishing research priorities and in allocating research resources. Finally, we wish to note the considerable effort that has been put forth in collecting and establishing an economic data base within the DAR in a readily utilizable form which, in our opinion, should and will be used to evaluate the economic feasibility and value of technical practices recommended by the DAR.

All of the abovementioned factors can be expected to have a positive and direct influence on the purpose of the project. However, some of the factors specified in the project paper as indicative that the project purpose has been met may not be realized until well after the PACD of November, 1984.

### Conclusion 2

The evaluation team found disparities of expectations for the project among the USAID, the GOM and the UF technical assistance team. Each assigns different relative priorities to production of research results, institutional strengthening and the provision of commodities, physical facilities and services. The PP clearly states that the purpose of the project is:

> to strengthen the capability of the DAR to provide economically sound and socially acceptable research for smallholder needs in satisfactory quantity and quality and in a form which is readily usable by the Technical Officers who supervise and backstop extension agents.

The team believes that this points to institutional strengthening as the highest priority of the project, with production of sound and appropriate research results as a means of achieving the project purpose.

Conclusion 3

The project management functions for the project are shared in an informal manner between the DAR, the UF Chief-of-Party and USAID. The present management arrangement does not provide for clear and coordinated project direction. The financial management system of the project appears adequate to insure against the misuse of project funds. It does not, however, allow for joint planning and budgeting by the concerned parties and the discretionary budgetary adjustments to improve the implementation of the project that would be inherent in such an exercise. Probably most critical, there appears to be no single management unit or individual who has responsibility for, control over, and a thorough knowledge of the project's resources and the totality of the various activities of the project. The evaluation team is frankly surprised that the rather diffuse management system has permitted the project to function as well as it has to date. We believe, however, that some critical decisions need to be made rather quickly concerning the allocation of resources between input categories for the remainder of the project. We believe that these decisions should be made jointly by the UF, the DAR and USAID.

Recommendation 1

We recommend that:

(A) AID and the UF prepare an up-to-date financial status report of available project resources and in so doing, determine an acceptable format for future financial reports;

(B) When (A) is completed, that USAID, UF and the DAR meet and determine what remaining technical assistance is required for the duration of the project, what further training should be initiated, what commodities are yet to be procured and whether existing project funds are adequate to complete the project;

(C) that AID, UF, and the DAR develop a financial management plan for the remaining life of the project and that the concerned parties periodically exchange information on the use of project funds and discuss any adjustments in budgets that may be required; and,

(D) that USAID/Malawi and the GOM jointly determine a better project management system for any follow-on project.

Conclusion 4

After having reviewed individual qualifications, job descriptions, and work plans, the evaluation team feels that the UF team possesses the requisite technical qualifications and skills. We would have preferred to see more research experience in developing countries, especially Africa, but nonetheless believe the present team to be technically qualified.

We note that there has been a general tendency for the UF team members to assume research management responsibilities for specific commodity programs or research sections. This was anticipated in the project paper. However, the assumption of management responsibilities for various commodity or research sections (a) has reduced the intended input of the technical specialist into multiple commodity programs and (b) has tended to reduce the degree of interdisciplinary interaction of the team and between research programs.

Difficulties in filling the horticulture specialist position has jeopardized the expected project outputs to improve the horticulture research program and the evaluation team questions whether providing two horticultural specialists for the remainder of the project can be expected to have a substantial impact on the long-term viability of the horticulture research program.

Finally, we believe that the UF Chief of Party has the knowledge and experience to play a much more central role in coordinating and encouraging interaction between research programs and between research and extension. Unfortunately, the COP is presently responsible for a myriad of administrative tasks that are seriously distracting him from the role he was expected to play. We believe that an administrative assistant should be hired for the duration of the project thus freeing the COP to concentrate on those functions for which he was hired and for which he is best qualified to do. Any follow-on activity should also include an administrative assistant in the design to allow the COP to make a more substantive input to the project.

Recommendation 2

We recommend that the UF team, USAID/Malawi and the CARO review the internal division of responsibilities held by the various UF team members to insure (a) that the most knowledgeable individuals available from the UF team are advising Malawian researchers on their respective research programs, and (b) the division of responsibilities between UF team members encourages interdisciplinary coordination among research programs, and, (c) the team is provided adequate direction and coordination by the COP. Furthermore, once the abovenoted division of responsibilities has been reviewed, the UF, USAID/Malawi and CARO should identify priority areas where long-and short-term technical assistance is needed to consolidate the progress which has been made on the on-going research programs and insure such needs are fully met.

Conclusion 5

One of the fundamental intentions of the project was to create considerable coordination and cooperation between various research sections and programs. The summary project description clearly states..."Emphasis will be placed on assistance to improve and strengthen the systems for research coordination in the selection, implementation and management of reseach projects of optimum value to smallholders." Further, the PP states "Research programs will be established in production economics and farming systems analysis to correlate other research with the economic and sociological realities (faced by Malawian smallholders)." In this evaluation of the project, we have noted both the Farming Systems Analysis and Agricultural Economics Sections have been established and although somewhat small in terms of experienced staff, these sections are functioning. Thus, we have concluded that the basic mechanisms exist to provide internal interaction and coordination between research sections.

The evaluation team has also noted several examples of the cooperation between various research sections and programs which was anticipated in the design of the project. Specifically, interaction between the Maize Breeding Section and the FSA Section has helped to direct the maize breeding program to increase its efforts to identify high yielding open pollinated composite varieties of maize which have the "flinty" seed characteristics preferred by subsistance farmers. A second example of the desired interaction has been the work performed by the Agricultural Economics Section with the Farm Mechanization Section on the economic feasibility of using small tractors on irrigated fields. Further, the Agricultural Economics Section is also working with several crop research divisions helping to analyze the economic impact of several recommended practices (inter-cropping vs. pure stands, etc.). However, it appears that such examples are the exception rather than the rule and the evaluation team believes a great deal more interdisciplinary research work should be occurring. Moreover, the integration of farm-level diagnostic observations into research programs is much less efficient in an ad hoc setting than it is in a formalized, recurring and interdisciplinary team format.

Recommendation 3

We recommend that the UF team meet and come to an agreement on their general FSR approach. We also recommend that the UF team members, in consultation with their principal Malawian research staff, each decide how their own individual research programs can contribute towards adaptive on-farm research for the duration of this project.

Conclusion 6

A sound approach to conducting farm level adaptive research has been defined and initiated and has the general support of the DAR, but it is presently not being actively pursued. The evaluation team believes such farm-level adaptive research is critical for the evolving institutional development of the DAR and to increase the relevance of the research program to smallholders.

Recommendation 4

We recommend that shortly after the UF team reaches agreement on a general FSR approach and has identified the means by which the various commodity-oriented research programs can contribute toward adaptive on-farm research, the UF team meet with the CARO and CAO to reach agreement on the role of, and direction of, adaptive on-farm research conducted at the ADD level for at least the duration of this project and hopefully beyond.

Conclusion 7

The evaluation team has noted, in several contexts, the absence of clearly defined national research priorities and the difficulties that the absence of such priorities have caused during the implementation of this project. We believe that establishing national research priorities as well as priorities for specific research sections is critical for the long-term success of the project.

Several of the priorities established for different sections of the DAR under the current project appear rather diffuse and would have substantially benefited from clearly defined national research priorities. The evaluation team has reviewed the research priorities which are being established for the major research programs supported by this project and generally believes them to be satisfactory. Institutional mechanisms for setting national research objectives and insuring that individual research sections and programs comply with team objectives appear to be included in the proposed restructuring of the DAR. National research priorities are needed and would be of immediate benefit. The evaluation team believes that establishing national research priorities will be developed as a part of the restructuring process of the DAR. We find, however, that the assumption of the existence of national research priorities was a major omission in the project design.

Recommendation 5

We recommend that:

(a) the research priorities which have been defined for the major research programs supported by this project be considered provisional in nature until

such time as national research priorities are clearly established and section or program priorities are reviewed in conjunction with the national research priorities.

(b) that any reassessment of priorities or objectives which have been defined for the major research programs supported by the project be done in a manner which will give greater importance to the identified constraints faced by Malawian smallholders.

(c) that the DAR continue to pursue the establishment of national research priorities in conjunction with the proposed restructuring of the DAR.

(d) that USAID and the UF team provide appropriate encouragement and support for the establishment of national agricultural research priorities and the reorganization of the DAR.

Conclusion 8

A major assumption contained in the PP concerning the achievement of project goals was "that the extension service is sufficiently effective to disseminate and obtain farmer acceptance of socially and economically sound research recommendations when received in a form useable by extension service technical officers." The recent audit report on the project concluded that this could not be considered a valid assumption. The evaluation team believes that improvements can be made in the information dissemination system which serves smallholders and that it is a system in which research and extension have a joint role to play. The OFs of the ADDs, the recent restructuring of the Ministry of Agriculture and the proposed restructuring of the DAR to create adaptive research units at the ADD level offer, in the opinion of the evaluation team, an excellent opportunity to (1) build upon the accomplishments of this project to increase the relevance of agricultural research to smallholders, (2) provide an invaluable feedback mechanism for the DAR and (3) increase the quality and quantity of information provided to smallholders.

Recommendation 6

We recommend that USAID and MOA consider a follow-on to the present research project which focuses on developing the adaptive research units and extension units that will form critical components of a system for the dissemination of information and services to smallholders as well as continuing to strengthen appropriate component research.

Conclusion 9

The evaluation team recognizes the considerable role of Malawian women in agricultural production. We also believe that the Malawian government shares this viewpoint and has acted upon it to establish Women's Programme Sections at the ADD level to improve and strengthen the role of women in rural development. We believe the Women in Agricultural Development Project has been a successful complement to the Malawian Agricultural Research Project by identifying the constraints rural women face and areas in which more appropriate support can be provided by research and extension organizations. (See Appendix 1 for evaluation report of PPC/WID project.)

Recommendation 7

We recommend that the program initiated by the AID-supported Women in Agricultural Development Project be integrated into, and supported by the on-going Agricultural Research Project. Furthermore, any follow-on project should incorporate support for an element patterned on the WIADP model as an integral part of the DAR's long-term research program.

Appendix 1

EVALUATION OF THE PPC/WID - UNIVERSITY OF FLORIDA
WOMEN IN AGRICULTURAL DEVELOPMENT PROJECT
(Project 930-0300)
(Contract No. AID-OTR-0300-C-00-2081-00)

## Introduction

The Women in Agricultural Development Project (WIADP) in Malawi is nearing completion. An evaluation of the project was undertaken in conjunction with a midterm evaluation of the USAID/Malawi Agricultural Research Project. Part of the purpose of the two evaluations was to provide guidance for a follow-on project in agricultural research and extension to be obligated in FY 1983. The findings of the WIADP evaluation indicate that the project has been highly successful and contains elements that should be incorporated into the follow-on project. In addition, with certain modifications for variation in country situation, the WIADP could serve as a model for other, similar PPC/WID-funded activities complementary to larger bilateral assistance efforts.

## Background

In March, 1981, Dr. Anita Spring, University of Florida, submitted an unsolicited proposal on Women and Agricultural Production in Malawi.[1/] After a number of delays, the project proposal was approved by the Government of Malawi (GOM) and USAID/Malawi and funded by the Program and Policy Coordination Bureau's Women in Development Office (PPC/WID). The project was funded for the period from March 1, 1982 to March 31, 1983. The project Scope of Work had three major elements:

1. Collection of data on women's agricultural work in diverse contexts;

2. Identification of women farmers' needs which might be addressed through AID projects; and

3. Preparation of a manual that will allow project workers and host country planners to ascertain whether or not their projects consider women in terms of training and benefits.

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1/ The project is now formally titled the Women in Agricultural Development Project.

These elements were designed to meet the project's objective of developing guidelines based on the study of women farmers and agricultural development in selected agroeconomic areas in Malawi in order to strengthen project planning and extension services to rural women.

## Evaluation Methodology

This evaluation was conducted in conjunction with the midterm external evaluation of the USAID/Malawi Agricultural Research Project (612-0202), implemented under a contract with the University of Florida (UF). A separate scope of work (Attachment 1) was prepared for the conduct of the WIADP evaluation, and, as with the larger project evaluation, the findings will contribute to the design of the follow-on agricultural research and extension project now under consideration by USAID/M and the GOM.

The evaluation took place during the period January 25 - February 8, 1983. Documents produced by the WIADP during the past year, including reports, survey instruments and handouts, were reviewed (see Attachment 2 for a listing of documents). Interviews were conducted with project personnel, selected Ministry of Agriculture (MOA) officials, University of Florida technical assistance (t.a.) and USAID/M staff (see Attachment 3 for a list of persons contacted). Two field visits were undertaken, one to Ngabu Agricultural Development Division (ADD) to interview the Women's Programmes Officer (WPO), and one in Lilongwe ADD to observe the on-farm trials being conducted by the project agronomist. The evaluator has also benefited from copious notes prepared by WIADP project staff in response to the specific elements in the evalution scope of work. Many factual elements of the evaluation report were drawn from this material.

## Project Inputs

The project was funded in the amount of $125,766.00. That amount covered salaries for the Principal Investigator, Dr. Anita Spring, a Research Associate, Mr. Craig Smith, short-term consultants and secretarial staff; travel and per diem; equipment and supplies (including computer time) and administrative costs. In addition, the Government of Malawi made substantial contributions to the project. The GOM seconded Miss Frieda Kayuni, a Bunda College graduate, to the project from the Development Department. Material contributions include office space and furnishings; use of the Chitedze Agricultural Research Station's (ARS) facilities

(i.e., utilities, mail and messenger services); vehicles from the central MOA and various ADD motor pools, often without charge for petrol and maintenance; staff housing; interpreters for fieldwork and support for attendance at a number of workshops and conferences. The MOA has also provided support services, such as official memoranda and clearance letters, and the processing of various administrative matters. The WIADP is in all respects considered a section of the Department of Agricultural Research, although it does not formally appear on the organization chart.

The project has also benefited from close association with the Farming Systems Analysis (FSA) Section (funded under the USAID/M Agricultural Research Project) of the Chitedze research station. Joint data collection efforts have been undertaken using the combined staffs, augmented by ADD-level personnel and enumerators hired by both the FSA and WIADP Sections (WIADP paid the majority of the salary costs for the enumerators.). This section also provided transport on occasion, and has undertaken microcomputer storage and analysis of jointly collected data. Advice and counsel from both long-term and short-term technical assistance staff provided by UF have also been solicited by the WIADP from time to time.

## Project Outputs

Discussion of project outputs will follow the scope of work (Attachment 1) provided for the WIADP evaluation. The scope of work notes that the WIADP has provided progress reports sufficient to detail the project activities (Attachment 4 is a recent publication summarizing major WIADP activities.). Copies of these reports are available from the WIADP section, USAID/M, the AID/W Malawi Desk and the PPC/WID Office. This report will therefore concentrate on an analysis of project outputs in achieving the project objectives.

### A. Research Objectives

#### 1. Appropriateness of socio-economic data to achieve stated project objectives

Data have been collected on a wide range of factors affecting rural women. In addition to farm-level socio-economic data, agronomic information has been gathered. Data have also been collected on the organization of agricultural services for reaching rural women. Formal and informal information on attitudes toward reaching women farmers has been obtained as well.

Data collection has taken place in several of Malawi's agroecological zones with diverse farming systems. Principal zones covered include:

a. high plateau - characterized by mixed rainfed crop and livestock agriculture, looking at both a GOM-designated Rural Development Project (RDP) area and tobacco estate agriculture

b. lakeshore - characterized by rainfed and irrigated rice schemes and fishery at lower altitudes

c. middle altitude semi-arid plain - characterized by drought-prone climate, maize intercropped with legumes and oilseeds and rainfed rice agriculture, high population densities and male outmigration for off-farm employment.

This range of agroecological zones and subsistence patterns allowed disaggregation of data according to several parameters: gender, socio-economic status, traditional vs. progressive farming, participation in the cash economy, level of education, access to social services, etc. Although much of this information had been collected as parts of the National Sample Survey of Agriculture, other national surveys, the annual evaluation surveys conducted at the ADD level and the farming systems diagnostic surveys, there had been no systematic effort to disaggregate data and analysis by gender and in terms of women as agricultural producers rather than as "homemakers." Progress has been made in several ADDs in disaggregating the NSSA data by male and female household heads under the leadership of the WIADP.

The data collection has been more complete than some of the more selective surveys routinely performed by the GOM. This has allowed a holistic analysis of the roles of all household members in productive enterprises, domestic tasks, social and political activities, etc. Such an analysis should provide to both AID project designers and GOM clients of the projected manual insights into present rural activities and values and development trends that might be enhanced, with an emphasis on the differences between men and women, heretofore downplayed or overlooked. It is important to note that project data have not focussed exclusively on women (in its farm-level surveys), but has collected information to highlight the <u>similarities and differences</u> between men and women.

2. <u>Relevance to GOM agricultural research programming and policy</u>

The GOM and MOA have informally articulated their concerns to increase smallholder production. At the same time, there is a recognition that women are a significant element in that

production. The thrust of the Malawi National Rural Development Program (NRDP) since 1978 has been to improve the well being of the rural population through delivery of services for both social welfare and agricultural production. No special provisions for women in agricultural productin were incorporated in the early phases of NRDP; however, in 1981 the MOA moved to change the emphasis of its extension to women from home economics to agriculture. This was implemented by creating a WPO position in each ADD and in the central ministry, and by beginning to retrain the Farm Home Assistants (FHAs - female extension workers). The WIADP has helped to document women's lack of access to agricultural information and services, such as extension and credit, needed to increase agricultural production. The Department of Agricultural Research (DAR) has also moved to adopt a farming systems approach to adaptive research. The WIADP participated in diagnostic surveys to identify smallholder farming constraints with particular emphasis on disaggregation of data by sex.

One of the most impressive features of the project is that it has exceeded the original scope of work in a number of ways, while still accomplishing the original objectives. In this case, the project has gone on from the identification of smallholder problems through the data collection and analysis to making recommendations and taking action to improve service delivery to women (beyond the scope of the manual stipulated in the contract). Specifically, members of the project staff have:

- assisted in revising the curriculum for refresher training for the female extension service (FHAs);

- contributed to the curriculum planning for the FHA program at the new Natural Resources College (certificate training for extension);

- worked on proposed revision in the career ladder for women in the Department of Agricultural Development (extension);

- made presentations to ADD headquarters staffs at the request of the Programme Managers and made specific recommendations on handling data to evaluate differences between male and female farmers;

- made recommendations to ADD Evaluation sections for disaggregation by sex of data and analyses; and

- been asked to evaluate all ADD programs for ways to improve assistance to women farmers.

Overall, it appears that the MOA has had a longstanding, but somewhat undefined, concern to improve its programs for women in agricultural production. The WIADP has been able to offer concrete proposals for action to address this concern and has most likely contributed to the evolution of a more coherent policy (as yet unarticulated, but potentially part of NRDP V) on women in agricultural development.

## B. Methodology

### 1. Effectiveness of social scientist/agronomist team approach in gathering socio-economic information relevant to the agricultural research program

The interdisciplinary approach has been critical to the achievement of project objectives and to some of the additional tasks undertaken by the project. First, the project collected agronomic as well as socio-economic information, using a modified farming systems approach. This allowed an analysis of the whole farm system, with disaggregation by sex, rather than a piecemeal look at women's roles within the system. Second, the combination of disciplines lent credibility to the research effort in the eyes of other DAR professional staff. Thus, it was key to establishing credentials as researchers whose results were worthy of attention. The DAR has had little past experience with socio-economic research, and many of the biological scientists believe that it is insubstantive by comparison. It was less difficult to establish credibility with the extension service, and the whole farm system approach has identified problems that can be addressed under current programs (such as lack of access to credit by women, or inappropriate credit and technology packages for women).

Perhaps one of the most interesting outgrowths of the interdisciplinary approach is a small agronomic adaptive research activity that was initiated at the request of women farmers in Unit 2 of Lilongwe ADD. The activity is a series of on-farm soybean trials under women farmers' management. In 1982, the need for more information on soybean production (as opposed to information on cooking already available) was identified by the WIADP during an early farmer survey. That year, the WIADP prepared handouts using research station recommendations, held a planting demonstration with Chitedze ARS staff and coordinated the provision of inputs for planting demonstration plots.

In 1983, recognizing that farmers had some objections to the research station recommendations (i.e., plant spacing, etc.), a series of simple, women-farmer-planted-and-managed trials were designed and carried out. The method used to implement these

soybean trials in 1982-83 is a model that other sections of the DAR should look to in planning and carrying out adaptive trials. Each of the women trial cooperators assisted in planting an identical soybean trial at the Unit Centre under the supervision of research and extension staff. Each woman farmer received supplies for one trial, and planted the next day in her own field. This approach involves research and extension staff in a more participatory manner with the farmers than in other models, and is thus an excellent candidate for replication. The specific focus on women farmers should also be maintained, although more attention will have to be given to follow-through by the male extension service. The project has gotten researchers and extension workers onto women farmers' fields and talking to women farmers, and this is an important first step. It allowed the WIADP to respond to a women-farmer-identified need, and to complement the data collection and analysis mode with a more action-oriented hands-on approach.

It has been important for maximum program impact that the WIADP has provided effective liaison between research and extension. Both socio-economic and agronomic researchers have been able to provide specific expertise and analytical skills at various levels - farm, extension service, research and policy/program. The interdisciplinary approach is particularly replicable in the Malawian research and extension organizations, and should be assured in any subsequent effort in Malawi.

2. Workability of questionnaire

The following WIADP sets of questionnaires were reviewed:

a. Farm Home Assistants
b. Soyabean Project
c. Karonga Farmer Survey
d. Phalombe Interviews
e. LRDP Survey
f. Women's Programmes Evaluation for MOA - Questionnaires for Management and Every ADD Section
g. Stall-feeders
h. Groundnut Production
i. Agricultural College Students

The Phalombe Interviews and LRDP Survey were developed and administered jointly with the Farming Systems Analysis section. Each of the other questionnaires was designed to elicit information on a specific topic. This has facilitated a quick turn-around of actionable recommendations. The larger, longer-term surveys have provided more holistic information on the farming systems and have necessarily been more detailed. The LRDP Survey is a longitudinal study relying on baseline

data collected in 1969/70 and NSSA data collected in 1980/81. One hundred forty-four of the original households were reinterviewed in the 1982 survey, using approximately 15 different survey instruments over a two-month period. This type of survey with extensive questionnaires provides a very rich data base for studying development trends. The WIADP was instrumental in assuring that all questionnaires disaggregated information by sex, and will participate in the analysis of the data with emphasis on the role of women in all phases of the rural economy. The evaluator considers it crucial that policy implications and recommendations be made on the basis of the longitudinal survey. Such recommendations will enhance the support for this type of in-depth survey work, which is currently regarded with skepticism by many DAR and MOA decisionmakers.

3. Complementarity and coordination of WIADP and larger farming systems research (FSR) methodology

Some of the complementarity and coordination between the WIADP and FSA sections has been discussed in the foregoing two sections. In addition, it should be noted that WIADP has a specific emphasis on women as a client group, while the larger FSA section has a more general concern with the smallholder farmer. The WIADP has also pointed out the statistical significance of women as farmers and encouraged the FSA section to take that into account in the design of its diagnostic surveys and on-farm research. The WIADP has both drawn from the FSA section, in terms of data, manpower, logistical and financial support and contributed the same elements to FSA section efforts by working in tandem in two surveys. In these efforts, the project agronomist has been involved in the collection of agronomic data equally with DAR and extension personnel, while the WIADP Principal Investigator and the FSA section head have supervised the collection of socio-economic information and its analysis.

4. Difficulties specific to working with women farmers in Malawi

The WIADP staff itself has experienced no difficulty in working with women farmers. However, they have identified others' difficulties, particularly the male extension agents' inability or lack of incentive to reach women farmers. The WIADP suggested and developed an extension aids circular on techniques for male extension workers to reach women farmers and is writing it. The project has also been closely monitoring an innovative technique being tried in Blantyre ADD to allow more women farmers access to credit . Further work could be carried out in improving women's access to credit and extension, and it is hoped that the WIADP project, particularly

in its review of programs for women in the ADDs will be able to offer some suggestions that can be implemented subsequent to project termination.

## C. Institutional Linkages

### 1. GOM support

The GOM has been very materially supportive of the project, as detailed in the Project Inputs section of the evaluation report. From the project's inception, a high level of interest has been demonstrated by MOA officials such as the Secretary for Agriculture, the Chief Agricultural Research Officer, the Chief Agricultural Officer (extension head) and the ADD Programme Managers. Evidence of acceptance of the need for such an activity by the GOM is twofold: 1) the fact that the WIADP staff is treated as a section in the DAR and accorded all the benefits that entails; and 2) the WIADP has been asked to take on additional tasks as outgrowths of the original scope of work. Recent examples of the latter include the request by the Secretary for Agriculture to review women's programs in all ADDs and a formal request from the MOA to prepare the manual specified in the contract scope of work, thus assuring the manual a wider audience and a serious reception by MOA officials.

### 2. GOM expectations for the future of the project

Unfortunately, the MOA has no immediate plans to continue the project activities. They are, however, undertaking two exercises that may allow for the inclusion of a women's section within the next year. First, the DAR is undergoing a major reorganization that will place greater emphasis on adaptive research and closer linkages to the extension service. Secondly, the MOA is participating with USAID/Malawi in the design of a follow-on to the Agricultural Research Project. The technical assistance and training components of the follow-on project could include provision for the WIADP section to be continued.

### 3. Degree of collaboration between the Malawi Agricultural Research Project and the WIADP

As noted above, there has been substantial collaboration between the FSA section (funded under the USAID Agricultural Research Project) and the WIADP. Other collaboration has been on a one-time and very limited basis. The WIADP agronomist was advised by one of the UF technical assistance team, for example. Similarly, the WIADP has had limited access to the short-term t.a. provided under the UF contract. In the main,

though, the WIADP has not interacted with most of the technical assistance team from UF.

The lack of collaboration appears to be an artifact of problems in WIADP project start-up, so that the project began significantly later and under a cloud of ambivalence on the part of USAID/Malawi (see Section D below). The GOM and UF/Gainesville perceive the two projects as more closely linked than they are in reality. Thus, when short-term technical assistance has been sent from UF, the WIADP project has occasionally benefited as though it were part of the larger project. The UF long-term technical assistance team has been informally on call for consultation; however, that team has not taken full advantage of the additional expertise and information available from the WIADP. This problem has likely been compounded by the close alliance between the WIADP and the FSA section. As detailed in the evaluation to which this report is annexed, the FSA section has also had problems of integration within the larger project. There is a general perception by the biological researchers (including the members of the UF team) that socio-economic data collection and analysis are not actually "research." Quantity of empirical data appears to carry more weight than quality of analysis. Perceptions of this sort are not limited to the UF technical assistance team nor to Malawi. The WIADP, in its institutional-strengthening, programmatic orientation has helped somewhat to bridge the gap in understanding, but it will not be closed during the life of the project, or in the foreseeable future.

## D. Assessment of the WID Component Add-on Approach

### 1. Impact

The project has achieved its objectives of data collection on all aspects of women's agricultural work, of drawing implications for AID-sponsored activities to respond to women farmers' needs and is in the process of preparing the manual for GOM extension agents and planners. It has also embarked on several unanticipated, related activities, such as the research-extension liaison, the agronomic trials directed at women farmers and the advisory role to MOA on policy for reaching women farmers. A concern with women as agricultural producers has been institutionalized within the MOA, although the GOM looks to the donor community to provide personnel to address that concern. Thus, the project has not only been successful in assuring that sex-disaggregated socio-economic and agronomic data have been collected and utilized, it has created a demand for further work, from the Departments of Agricultural Research and Agricultural Development (at both headquarters and ADD levels) and the Planning Office of the MOA.

2. Replicability

The WIADP staff has identified several elements of the project that are appropriate for replication elsewhere:

- working with the Ministry of Agriculture staff to assure that the project proposal addresses their concerns and incorporates their advice

- use of the farming systems research approach

- use of key indicators

- working at various levels (farm, extension service, research, program and policy)

- use of an interdisciplinary team approach with both male and female staff members, where possible

- using specific strategies for disaggregating data

- meeting with section personnel and policy makers

- obtaining reports from field staff, sections, etc. with disaggregated data

- writing reports with the specific objective of disaggregating data

- designing new report formats

The evaluator believes that the following additional elements should be considered for replication:

- focus on institutionalization of WID concerns as well as data collection and analysis

- careful attention to the institutional structure onto which the project is grafted

- emphasis on policy-oriented, actionable recommendations for the host country as a project output (during the entire life of the project as well as the type of output represented by the manual)

- movement into action research and extension activities, such as the soybean research and extension training elements

- coordination with host country farming systems research

- adoption of a holistic approach, looking at the similarities and differences between male and female farmers rather than a single focus on women.

The WIADP staff points out that the Malawian organization for agricultural development may be unique, and certainly facilitated the project. The NRDP approach, with areally-based development programs (the ADDs) makes a substantial impact possible, as the approach is both highly organized and relatively decentralized. Also, Malawi is a fairly small country, making the NRDP approach manageable. In larger, less well articulated host country programs, more staff and higher funding levels would be necessary to achieve similar impact.

3. Contributions to project success

The WIADP staff feel the following have contributed to project success:

- excellent encouragement and support from the MOA

- well organized extension staff with good record-keeping to which the WIADP had access for documentation, data and farmer interviewing

- facilities at and affiliation with Chitedze ARS

- media coverage of the National Workshop on Women in Agricultural Development

- an enthusiastic, independent staff, willing to work overtime, learn Chichewa, tolerate village conditions, etc.

- support of ADD Programme Managers

- staff versatility in working at many levels, and good access to those levels

- excellent secretarial assistance

- autonomy in funding and decisionmaking.

The evaluator would add that

- the interdisciplinarity of the team and the high quality of research lent considerable credibility to the project, particularly as far as the MOA is concerned, and facilitated institutional strengthening

- the project staff has actively sought opportunities to advise on policy decisions and work in programming and training

- the liaison with extension allowed the research to bear immediate fruit

- the unanticipated institutional strengthening element reinforced the original project objectives and contributed heavily to the GOM perception of a succcessful activity.

4. Problems experienced by the project

The project's original objectives were fairly modest. The project has expanded beyond its research role and this has had implications for project resources. The project had difficulty securing consistent support from USAID/Malawi. Among other things, this delayed project start-up by almost nine months and resulted in the loss of one of the proposed researchers to another activity. The UF technical assistance team from the Agricultural Research Project has largely ignored the WIADP, instead of taking advantage of it. The WIADP activity suffered from inadequate backstopping from PPC/WID.

Resources: The project was underbudgeted and underfunded. Funds for transport (a vehicle, maintenance and petrol), Malawian counterparts and staff for interpretation and clerical work and operating costs should be more carefully and realistically planned and included in future contracts. A contingency factor should be built in. Another way for PPC/WID to address this problem is to work to have a similar component incorporated in major bilateral projects (especially those implemented through Title XII universities), drawing on project funds and Title XII strengthening grant monies.

Coordination and support: The project start-up suffered almost a year's delay due to obstacles emanating from the Malawi AAO and the AID/W/SER Contracts Management Office. This is well documented in the USAID/Malawi files. In addition, certain administrative problems developed between USAID/Malawi and WIADP after project implementation began. Although it is unlikely that all of these circumstances would converge again, PPC/WID should have assessed the situation early on and attempted to intervene constructively. Certainly, once the contract was signed, PPC/WID should have maintained more active contact with the project rather than relying on a one-way flow of reports. This holds true of USAID/M as well - once it had cleared the project, it should have been more consistent in its support. Administrative procedures should have been more clearly spelled out so that centrally-funded contractors' rights and responsibilities vis a vis the country AID mission are fully understood by all parties. The relationships with the bilateral projects to which the WID activity was added should have been clarified at the outset.

E. Evaluation Recommendations

1. The WIADP add-on should be brought into the mainstream of USAID/Malawi activities. The most appropriate way to accomplish this is to include a technical assistance position to carry on the work of the WIADP in the agricultural research and extension project being planned for obligation in FY 1983. USAID should note the following considerations in designing this aspect of the technical assistance:

- an organizational "home" for WIAD will have to be found in the structure of the DAR. The project designers should explore the most cost-effective arrangement for devoting resources to WIAD. Under the current reorganization plan, a likely place would be as part of the Farming Systems division. It would be useful for the WIAD technical advisor to have complementary skills to the Farming Systems Analyst t.a. (e.g., if that person is a social scientist, the WIAD coordinator might be an agricultural economist; if the FSA is male, the WIAD coordinator should be female or vice versa). Preference should be given to selecting a social scientist for the position, as the GOM has many fewer trained social scientists than biological scientists.

- whatever choices are made for the technical assistance to WIAD under the follow-on project are likely to be permanent, as far as the GOM is concerned. Therefore, organizational structure and advisor's discipline should be carefully considered during the project design.

- the WIAD position description should include the specific mandate to work with the Department of Agricultural Development to enhance agricultural extension service delivery to women farmers.

2. To support the above-recommended technical assistance position, AID should covenant with the GOM to

- second an agronomist to the section

- assign Malawian counterparts and include them in the participant training plan (Ms. F. Kayuni would be a likely candidate.).

3. The technical advisor's terms of reference should specifically include:

- continuing work on ways for male extension workers to reach women farmers

- devising bureaucratic incentives to assure that male extension workers utilize these techniques (see, for example, the work of David Korten on the NIA in the Philippines)

- embarking on small action research projects such as the soybean trials begun by the WIADP.

4. The Principal Investigator should assure that the results of the longitudinal survey return to Malawi as policy recommendations. This is important methodologically in terms of setting a pattern for subsequent work by Malawian research staff, and in terms of decisionmakers' perceptions of the utility and further support for this kind of research.

5. PPC/WID should be more careful to assess individual missions' receptiveness to centrally-funded add-ons, and the administrative capacity to accomodate them. An exploratory field visit by PPC/WID staff would be an appropriate means of assessment. PPC/WID should also improve its backstopping during project implementation.

Conclusion

The Women in Agricultural Development Project has exceeded original expectations. It has not only achieved research objectives, but has had a substantial impact on institutional development. Although it has not been as fully integrated with the USAID/Malawi Agricultural Research Project as it might have been, it can be treated as a blueprint for an activity to be integrated into the next bilateral project. As far as replication by PPC/WID is concerned, other similar efforts should place as much emphasis on the institutional strengthening aspects as on the data collection and analysis aspects.

UNCLASSIFIED

AID/PPC/WID:JALBERT:MH
1/20/83:EXT. 22808
AID/PPC/WID:STINSLEY

AID/AFR/SA:RWRIN(PHONE)

AID/AFR/DR:AHARDING(PHONE)

PRIORITY LILONGWE

INFO NAIROBI

ADM AID

E.O. 12065: N/A

TAGS:

SUBJECT: WOMEN IN AGRICULTURAL DEVELOPMENT PROJECT EVALUATION

REF: STATE 350165

1. AS PER REFTEL, THE FOLLOWING IS SCOPE OF WORK FOR PPC/WID PROJECT EVALUATION. SOCIAL SCIENTIST J. ATHERTON WILL CONDUCT EVALUATION AS PART OF HER RESPONSIBILITIES ON MALAWI AG RESEARCH (612-0202) EVALUATION, SINCE SUGGESTIONS AND RECOMMENDATIONS FROM WID PROJECT MAY BE USEFUL FOR FOLLOW-ON PID DESIGN. AS AGREED TO PRIOR TO HER DEPARTURE, ATHERTON WILL PREPARE SEPARATE REPORT ON WID PROJECT--WOMEN IN AGRICULTURAL DEVELOPMENT (WIADP) CONTRACT NO. AID-OTR-0300-C-00-2081-00 FOR PPC/WID.

2. STATEMENT OF WORK FOR TEAM (DR. SPRING AND RESEARCH ASSOCIATE) WAS TO (1) COLLECT DATA ON WOMEN'S AGRICULTURAL WORK IN DIVERSE CONTEXTS; (2) IDENTIFY NEEDS OF WOMEN FARMERS WHICH MIGHT BE ADDRESSED THROUGH AID PROJECT; AND (3) PREPARE A MANUAL FOR PROJECT WORKERS AND HOST COUNTRY PLANNERS THAT WILL ALLOW THEM TO ASCERTAIN WHETHER OR NOT THEIR PROJECTS CONSIDER WOMEN IN TERMS OF TRAINING AND BENETITS.

3. SINCE DR. SPRING HAS PROVIDED PPC/WID WITH REGULAR MONTHLY REPORTS INCLUDING AGRONOMIC FINDINGS AND TRAINING SESSIONS, AND THE RESEARCH RESULTS AND POLICY RECOMMENDATIONS WILL BE CONTAINED IN FINAL REPORT EVALUATOR SHOULD FOCUS ON RESEARCH OBJECTIVES, METHODOLOGY, INSTITUTIONAL LINKAGES, AND LESSONS LEARNED.

(A) RESEARCH OBJECTIVES: EVALUATOR SHOULD DISCUSS:

--APPROPRIATENESS OF SOCIO-ECONOMIC DATA TO ACHIEVE STATED PROJECT OBJECTIVES;

--RELEVANCE TO GOM AGRICULTURAL RESEARCH PROGRAMMING AND POLICY.

(B) METHODOLOGY. EVALUATOR SHOULD ASSESS:

--EFFECTIVENESS OF SOCIAL SCIENTIST/AGRONOMIST TEAM APPROACH IN GATHERING SOCIO-ECONOMIC INFORMATION RELEVANT TO AGRICULTURAL RESEARCH RPOGRAM;

--WORKABILITY OF QUESTIONNAIRE;

--COMPLEMENTARITY AND CO-ORDINATION OF WIADP AND LARGER FSR PROJECT METHODOLOGY;

--DIFFICULTIES SPECIFIC TO WORKING WITH WOMEN FARMERS IN MALAWI.

(C) INSTITUTIONAL LINKAGES. EVALUATOR SHOULD DESCRIBE GOM SUPPORT--ESPECIALLY MINISTRY OF AGRICULTURE ASSISTANCE--FINANCIALLY AND LOGISTICALLY:

--GOM EXPECTATIONS FOR FUTURE OF PROJECT;

--DEGREE OF COLLABORATION BETWEEN MALAWI AG RESEARCH PROJECT AND WIADP.

(D) FINALLY, IN A SEPARATE SECTION FOR PPC/WID, THE EVALUATOR SHOULD ASSESS THE WID COMPONENT ADD-ON APPROACH TO ASSURING THAT SEX-DISAGGREGATED SOCIO-ECONOMIC DATA COLLETION BE USED IN FORMULATION OF POLICY, AND SPECIFICALLY IN THIS PROJECT, THAT THE DATA CAN CONTRIBUTE TO THE DEFINITION OF AN AG RESEARCH PROGRAM. ADDITIONALLY, PROJECT SHOULD BE EVALUATED IN TERMS OF (1) REPLICABILITY (ESPECIALLY IN FIELD METHODOLOGY); AND (2) PARTICULAR FACTORS WHICH CONTRIBUTED TO THE SUCCESS/ PROBLEMS OF THE PROJECT.

Attachment 2

DOCUMENTS REVIEWED FOR THE EVALUATION REPORT
WOMEN IN AGRICULTURAL DEVELOPMENT PROJECT

Reports


1. Dr. A. Spring - Farm Home Assistants and Agricultural Training. September 1981 (9 pages)

2. Dr. A. Spring - NSSA Series - KRADD: A Preliminary Analysis of 3 Surveys in Terms of Male and Female Household Heads. October 1981 (10 pages)

3. Dr. A. Spring - Soyabean Production in Unit 2. December 1981 (6 pages)

4. Dr. A. Spring - Stall-feeding in LRDP. January 1982 (8 pages)

5. Dr. A. Spring - Adapting CIMMYT Farming Systems Survey Guidelines to the Malawian Situation. February 1982 (4 pages)

6. Dr. A. Spring - Background Data on Women and Men Farmers in Kawinga and Lake Chilwa, Liwonde Agricultural Development Division. March 1982 (5 pages)

7. Miss F. Kayuni - Agricultural Refresher Course for LADD Female Extension Workers. February 1982 (10 pages)

8. Dr. A. Spring - Women in Agricultural Production in Malawi. Address to Extension Workers. April 30, 1982 (5 pages)

9. Mr. C. Smith - Report on Unit 2 Soyabean Trials. April 30, 1982 (3 pages)

10. Miss F. Kayuni - Female Extension Workers and Agriculture: Training for Women. Address to Extension Workers. April 30, 1982 (3 pages)

11. Mr. C. Smith - Agronomic Report on Unit 2 Soyabean Trials. May 10, 1982 (7 pages)

12. Dr. A. Spring - Report on Soyabean Farmers in the Thiwi-Lifidzi Project Area. June 24, 1982 (4 pages)

13. Dr. A. Spring, Miss F. Kayuni, Mr. C. Smith - Karonga Farmer Survey. June 30, 1982 (28 pages)

14. Mr. C. Smith - NSSA Series: Comparisons between Female and Male-Headed Households from the NSSA 1980-81 Garden Survey of LRDP, Malawi. October 1982 (4 pages)

15. Dr. A. Spring - Farmer Survey in Karonga: Considering the Role of Women in Agriculture. October 1982 (6 pages)

16. Mr. C. Smith - NSSA Series: An Analysis of the Yields from the NSSA Yield Survey in Terms of Male and Female-Headed Households. December 1982 (13 pages)

17. Miss K. Utterback - Appropriate Technology: Women's Responses to the Hand Operated Chitedze Maize Sheller. (8 pages)

18. Dr. A. Spring - Women in Agricultural Development Project, USAID/University of Florida. February 1983. (9 pages)

Proceedings

Proceedings of the National Workshop on Women in Agricultural Development, March 9-10, 1982, compiled and edited by Dr. A. Spring (76 pages).

Monthly Reports

December 1981 - present

Miscellaneous Handouts

1. Recommendations for Growing Soyabeans (English and Chitedze Versions) November 1981

2. Syllabus for Teaching Soyabean Agronomy and Recipes to Farmers. Dr. A. Spring and Training Section, LADD. March 1982 (7 pages)

3. Tables Analyzing the Breakdown of Classroom Hours of Agriculture and Home Economics Courses in the Syllabus for Farmer Training at Day Training Centers, Residential Training Centres and Farm Institutes (prepared by Mr. C. R. Smith). November 1982 (7 pages)

4. Tables from "The Work Done by Rural Women in Malawi," by B. Clark (6 pages)

5. Summary of Women and Handicrafts: Myth and Reality by J. Dhamija (adapted by Dr. A. Spring) (5 pages)

6. Tables on Male and Female Labour Allocation in LRDP extracted from J. Kydd "Farm Management Report No. 1, Labour Allocation and Crop Labour Requirements," LRDP 1978

7. Annual Work Plans (prepared by Dr. A. Spring, December 1982)
   (a) Format
   (b) Recommendations and strategies for increasing women's participation in credit programs
   (c) Recommendations and strategies for introducing the Chitedze Maize Sheller to women farmers

Evaluation of Women's Programmes

Reports on the evaluation of Women's Programmes for Ministry of Agriculture, Agricultural Development Divisions (ADD) and Training Institutes - Dr. A. Spring, Mr. C. Smith and Miss F. Kayuni.

1. An Evaluation of Women's Programmes in Salima ADD: How SLADD Sections and Projects Can Incorporate More Women Farmers in their Programmes. January 1983 (15 pages)

Attachment 3

List of Persons Contacted

WIADP Staff

Dr. A. Spring, Principal Investigator
Mr. Craig Smith, Research Associate
Miss F. Kayuni, Project Staff

Ministry of Agriculture

Dr. H. Mwandamere, Acting Chief Agricultural Research Officer
Mr. Ndisale, Deputy Chief Agricultural Development Officer
Mrs. C. Chibwana, Women's Programmes Officer
Mrs. M. Chiligo, Food and Nutrition Officer
Mrs. R. Ayoade, Assistant Food and Nutrition Officer

Ngabu ADD

Miss Chimberenga, Women's Programmes Officer

University of Florida Technical Assistance Team

Dr. D. McCloud, Chief of Party
Dr. A. Hansen, Farming Systems Analyst

USAID/Malawi

Mr. S. Cole, AID Affairs Officer
Mr. D. Garms, Project Officer

# WOMEN IN AGRICULTURAL DEVELOPMENT PROJECT
## USAID/UNIVERSITY OF FLORIDA

ANITA SPRING, CHIEF OF PARTY
CHITEDZE AGRICULTURAL RESEARCH STATION
P.O. BOX 158
LILONGWE, MALAWI

The Women in Agricultural Development Project (WIADP) aims to develop guidelines based on the study of women farmers in relation to agricultural development in selected agroeconomic areas in Malawi in order to strengthen project planning and extension service to rural women. Data on women in diverse agricultural contexts are being collected in terms of socio-economic and cultural variables, household dexision-making, knowledge and utilization of improved agriculture, indigenous and modern agronomic practices and interaction with extension services. The second aim of WIADP is to prepare a manual of topics and questions which will allow development planners to ascertain whether or not their projects consider women in terms of participating in project programmes and receiving project benefits. To reach this end, the Project is collecting data on project planning and implementation. Finally, WIADP is studying the needs of women farmers and extension staff which might be addressed in USAID projects.

WIADP is concentrating on three of the eight Agricultural Development Divisions (ADDs) of the country chosen by the Ministry of Agriculture. These are Karonga Agricultural Development Division (KRADD) in Northern Region, Lilongwe Agricultural Development Division (LADD) in Central Region, and Blantyre Agricultural Development Division (BLADD) in Southern Region. Other ADDs are being contacted as well. The Project is attempting national coverage and recommendations, although some coverage and recommendations will be area specific.

The following lists the various programmes and activities being undertaken by the Women in Agricultural Development Project. Many are on-going, some have been completed. WIADP is attempting to carry out a variety of extension and research activities to reach its objectives.



## RESEARCH ACTIVITIES

1. FARMING SYSTEMS SURVEYS

   (a) Liwonde Agricultural Development Division

WIADP participated in a Farming Systems Research (FSR) Survey in February 1982 in Kawinga Rural Development Project (RDP) of Liwonde ADD which formed the basis for research trials. This survey utilized the rapid reconnaissance, or first phase of FSR. A short report giving background data (Report No. 6) and a brief methodology paper (Report No. 5) were products of this survey. Women in the area are involved in a diversity of farming practices ranging from intercropping of maize and dry land rice to rain-fed rice schemes, and maize and tobacco estates.

(b) Lilongwe and Blantyre Agricultural Development Divisions

We did not carry out FSR surveys in LADD and BLADD because these had already been done in Lilongwe RDP of LADD and Phalombe RDP of BLADD by the Farming Systems Section at Chitedze Agricultural Research Station before the Project started. Although they did not specifically focus on women farmers, enough information was included to be of use to the Project.

(c) Karonga Agricultural Development Division

The team, working with staff from KRADD and local extension personnel, carried out a survey in June 1982. It focused on women farmers in irrigated and rain-fed rice schemes, cotton and maize schemes, and non-scheme maize and cassava growing areas in the Karonga Lakeshore areas. Reports 13 and 16 detail the farming systems of women in the various locations.

## 3. SURVEY OF DEVELOPMENT INDICATORS IN THE LILONGWE RURAL DEVELOPMENT PROJECT (LRDP) IN LADD

WIADP coordinated with the Farming Systems Section at Chitedze Agricultural Research Station to survey 144 households in LRDP in August-September 1982. There were fifteen survey instruments which included a measured dietary intake collected by interviewers who lived in the villages. The households were a sub-sample of the National Sample Survey of Agriculture (NSSA) households and a sub-sample of households originally surveyed in 1969. The people studied reside on the Lilongwe Plain (high plateau) and primarily monocrop maize, groundnuts, tobacco, beans and sweet potatoes under rainfed conditions. The instruments administered to men and women in a household were:

- Household Composition
- Natality
- Education
- Status and Resources
- Farm Planning and Agricultural Knowledge

| | |
|---|---|
| Garden Land Tenure | Distance and Storage of |
| Migration and Work | Maize |
| Garden Inventory | Dietary |
| Garden History | Anthropometry |
| Garden Labour | Change and Development |
| | Maize |

In addition, fields and grain storage bins were measured. The data is in the process of being coded and computerized. The purpose of the Survey is to study:

(a) Changes in peoples lives as a result of a development Project.
(b) Sex differences in farming practices between men and women (in the same household) and between male and female household heads.
(c) The signficant indicators of farmer development.

3. STAFF-FEEDERS IN LRDP, LADD:

This project involved coordinating with extension personnel in the Animal Husbandry Section of LADD and interviewing farmers from October-December 1981 who did stall-feeding of steers from crop residues. The study looked at sex differences in recruitment, operations, remuneration, and how the enterprise fitted into the farming system (Report No. 4).

4. SOYABEAN PROGRAMME AND TRIALS IN LADD

In the 1981/82 cropping season, we had farmer-managed demonstrations in which 60 women farmers grew soyabeans. This programme came about through our interest in extension training for women (discussed below - see Report No. 3). In one unit of the Lilongwe Rural Development Project (LRDP) in LADD, 64 women were taught soyabean cookery but not soyabean agronomy. WIADP instructed them on how to grow soyabeans and gave them seed, fertilizer and inoculant. We translated the research and extension information from Chitedze and Extension Aids into a concise handout which was subsequently given to all extension staff in LADD (Handout No. 1). A version in Chichewa was given to farmers. A syllabus was prepared for female extension

workers (Handout No. 2). We did follow-up on how the women fared, studied whether or not they followed recommendations, and measured their yields (Reports 9 and 11). Farmers growing soyabeans in the Thiwi-Lifidzi area were interviewed to discover their experiences with the crop (Report No. 12).

As a result of the interviews and demonstrations, a technical problem concerning the method of inoculating the seed was identified. Research recommends a slurry method in which the seed is coated; however, the inoculant loses its viability in the time between being coated at the training centre and when the farmers actually plant the seed. There are problems with keeping the inoculant refrigerated until it is needed as the day training centres do not have refrigeration. On farm farmer-managed trials in the 1982/83 cropping season will compare three methods of soyabean inoculation. The treatments are 1) no inoculum, 2) inoculum mixed with seed, and 3) inoculum mixed with sand and applied in the furrow. Besides the Unit Centres, five women farmers from each of four units have planted this trial.

This soyabean programme is intended to point out that (a) home economic training is not sufficient for women farmers who also need agronomic information; (b) research station recommendations may present difficulties under smallholder conditions; (c) women farmers should be included in on-farm, farmer-managed trials; and (d) research and extension need to relate to smallholder problems.

Additionally, WIADP convinced the management of LADD to embark on a free soyabean seed (with some seed being supplied by WIADP) distribution programme for women farmers. The programme is being administered by the Women's Programmes and Training Officers.

5. MAIZE TRIAL FARMERS IN ZHALONDE, SLADD

WIADP studied the farming systems and labour participation for the farmers who participated in the 1981/82 maize trials set up by the Farming Systems Analysis Section at Chitedze. Additionally a large baseline survey carried out by J. Evans

 

and data from the Evaluation Section in BLADD will be correlated in the report. The farming systems of most women farmers in this semi-arid, medium altitude terrain is intensive intercropping of maize and sorghum/millet, legumes and pulses (pigeon and cowpeas, green grams, chick peas) on small holdings.

6. NATIONAL SAMPLE SURVEY OF AGRICULTURE

In 1980-81 a nation-wide survey of households was carried out by the Ministry of Agriculture and National Statistical Office. WIADP is attempting to disaggregate the data by sex of the household head (an average of 29% of rural households sampled are headed by women) by going through computer print-outs and preparing tables. This will determine women's involvement in agriculture (crops grown and cultural practices, yields, extension services, resources, livestock, crop storage, etc.). Reports have been prepared commencing in September 1981 and continuing to the present based on the availability of the data (Reports Nos. 2, 14 and 16). Additionally, WIADP has inspired and convinced other ADDs (KRADD, LWADD, NADD, BLADD) to do this same kind of analysis and is making use of their reports.

7. FEMALE EXTENSION WORKERS: AGRICULTURAL AND HOME ECONOMICS TRAINING

The training, attitudes, interests and problems of the female extension workers (called Farm Home Assistants or FHAs) have been studied in August 1981 and January 1982 Reports No. 1, 7 and 10). The curricula of the training institutions (Thuchila Farm Institute and Natural Resource College) were also examined (December 1982 to January 1983).

8. GROUNDNUT PRODUCTION - INTERACTION OF ECONOMIC AND SOCIAL FACTORS

The production, marketing and consumption of groundnuts, one of Malawi's most important domestic and export crops, are being studied. The purpose is to consider 1) the interactions between pricing and producer decisions, 2) the relationship of groundnuts to other components of the producer's farming system, 3) the division of labour with special emphasis on..

women's role in groundnut production and remuneration and, 4) the agronomic methods employed in groundnut production. Two units in LRDP are being studied intensively (January-March 1983). If time permits another area wthere groundnut production is either marginal or non-existant will be used for comparison.

## 9. MISCELLANEOUS RESEARCH STUDIES

### (a) Labour Studies

WIADP correlates (Handouts Nos. 4 and 5) studies which document the involvement of women in Malawi's small holder agricultural sector. (Women do 50-70% of crop operations). Labour data was collected in the Karonga Farmer Survey, LRDP study of development indicators, and Phalombe Study of maize trial farmers.

### (b) Appropriate Technology

A small study on farmer knowledge and interest concerning a hand maize sheller called the Chitedze Maize Sheller was carried out in November-December 1982 (Report No. 17).

### (c) Methods of Working with Extension Staff

Methods by which the male field staff can work with female farmers have been studied informally as a background to extension work discribed below (Report No. 8 and Extension Aids Circular).

### (d) Survey of Market Vendors

A brief survey of vendors in Lilongwe urban and rural markets in December 1982-January 1983 was carried out to look at 1) sex differences in commodities sold and 2) producer-sellers versus buyer-sellers.

### (e) Interviews with Agricultural College Students

Female students from Bunda College of Agriculture and Colby College of Agriculture were interviewed in November 1982 and February 1983 respectively. The purpose is to find out about their recruitment into

 

the field of agriculture, experience as students, career plans, and problems women face in the agricultural profession in Malawi.

## E X T E N S I O N  A C T I V I T I E S

### 1. NATIONAL WORKSHOP ON WOMEN IN AGRICULTURAL DEVELOPMENT

In March 1982 a National Workshop on Women in Agricultural Development was held by WIADP to provide background on the topic of women in development and specific information on women farmers in Malawi. Participants were Women's Programmes Officers and others from the Ministry of Agriculture, researchers in the country working on women, and staff and students from Bunda College of Agriculture, Chancellor College, Colby College of Agriculture, and Thuchila Farm Institute. The Workshop received national media coverage. Proceedings from the workshop were published by WIADP.

### 2. WOMEN'S PROGRAMMES - MINISTRY OF AGRICULTURE

(a) Evaluation of Women's Programmes

In November 1982 WIADP was asked by the Ministry of Agriculture to help develop priorities, work plans and coordination strategies with other ministries for the Women's Programmes Section. WIADP is interviewing personnel from Ministry Headquarters, training institutions and the ADDs plus personnel from other ministries. Recording formats and work plans also are being reviewed (Evaluation of Women's Programmes 1-8 and Handout No. 7). Thus far, WIADP has interviewed management, heads of every section, and some project officers in 4 of the 8 ADDs and training institutions such as Thuchila Farm Institute, Mgomero Training College and Malawi Young Pioneers. Discussions have been held with them concerning ways in which they can 1) incorporate women farmers in their programmes and, 2) change the collection of field data and reporting formats so as to disaggregate the data on farmers by sex.

(b) Women's Programmes Officers and National Machinery Meetings

WIADP coordinates with the Women's Programme Officer

at Ministry of Agriculture Headquarters and participates in the Women's Programmes Section meetings and workshops at Ministry of Agriculture. WIADP assists in Women's Programmes Workshops in the ADDs (e.g., KRADD) and is a member of the National Committee on the Integration of Women in Development. In the latter, we helped to review the draft constitution and to write a plan of action for a National Machinery for Women in Development (August-October 1982). In December 1982, WIADP participated in the Extension Management Seminar for Women's Programmes Officers and helped draft the recommendations.

(c) Curriculum and Refresher courses

WIADP investigates the nature of refresher kcourses to women extension workers and has aided LADD in the preparation of a curriculum for a refresher course which included more agriculture than home economics training (Reports Nos. 7 and 12, Handout No. 3). WIADP has also made suggestions for the curriculum for female extension workers at the new National Resources College.

3. GRASSROOTS EXTENSION WORKERS

(a) Talks to Extension Staff

The project has given talks on methodologies for involving the large male extension staff in working with female farmers (Report No.8).

(b) Extension Aids Circular

WIADP has prepared a technical circular for all extension staff in the country in conjunction with the Extension Aids Division. The theme is methodologies, strategies and techniques by which the male extension staff can work with female farmers in training courses, extension advice, and credit programmes. Additionally, other materials and media events from Extension Aids will be including more information about women farmers because of WIADP's involvement.

4. EXTENSION MANAGEMENT

WIADP works with extension management at the ADDs to provide data on women farmers, instruct staff and give input on project design. With the concern for disaggregating data by sex of farmer, WIADP was able to have forms in the National Credit Manual changed to reflect this concern."

 

## PLANNING ACTIVITIES

### 1. Long and Short Range Planning, Ministry of Agriculture

The Planning Division, Ministry of Agriculture, has asked WIADP to work with them in terms of long range planning in general and on some Rural Development Projects in particular. The purpose is to set up mechanisms and make suggestions as to how rural women can be specifically included in Project proposals and design. Issues to be addressed are:

- a critical assessment of the present situation
- a description and evaluation of on-going activities
- a forecast for the future if nothing is done
- the organizational set up and how activities and programmes to include women agriculturalists can be carried out.
- assessment of personnel, budgets and timetables
- incorporation of the concern with women in agricultural development into a nationwide programme.

### 2. USAID Projects

WIADP meets with USAID teams who are planning projects in Malawi to provide input on the needs of rural women in development. Thus far the following teams have been briefed: Country Development Strategy Statement Teams (January 1982), Nellum Report on Extension and Training Team (April-May 1982), and the Pre-Project Identification Document Team (Ocotber-November 1982). It is anticipated that WIADP will contribute information to the Project Identification Document and Project Paper teams in the near future. The goals are to 1) build components into AID projects that will focus on women and 2) continue the work WIADP has started.

## S T A F F

Dr. Anita Spring, Chief of Party, Social Scientist

Mr. Craig Smith, Agronomist,

Miss Frieda Kayuni, Women's Programmes Officer (Seconded to WIADP by the Ministry of Agriculture

Ms. Karin Utterback, Socio-economist/Agronomist (affliated with WIADP).

Mrs. Cecilia Ndacheredwa, Secretary

Appendix 2

JOB DESCRIPTION - RESEARCH ECONOMIST

Qualifications:

Ph.D in agricultural economics with a minimum of five years of research experience in production economics farm management and substantial knowledge of smallholder mechanization. Field experience must include a long-term assignment (one year or more) in a developing country. Ability and willingness to carry on interdisciplinary research and to work effectively with host country personnel.

Duties:

Develop smallholder production economics research program;

Conduct economic analysis of research results, and make substantial contributions with other disciplines to all smallholder research packages regarding production practices (use of inputs, enterprise combination, rotations, etc.) that will increase incomes of small farmers;

Assist in the design of and carry on the economic analysis component of field trials in the unit farms;

Develop research program in smallholder appropriate technology, comparing different alternatives and identifying possible bottlenecks or economic factors that inhibit adoption such as credit, cost, land characteristics, etc.;

Assist research administrators in the selection of criteria for determining smallholder research priorities and in the periodic revisions of those priorities to fit overall Government development policy and work with all team members in selecting smallholder research projects and collecting/analyzing feedback;

Assist in development and implementation of research/extension liaison procedures and systems;

Assist in selection and processing of personnel for training in production economics research and in the selection of training institutions and in the design of training programs and follow up progress;

Prepare trainees and counterparts to take over the responsibilities of production economics and smallholder appropriate technology programs;

Assist with short courses and other in-service training for counterparts and other DAR personnel in production economics research and smallholder appropriate technology research, to include development of syllabi and course materials and course presentation where GOM resources not available;

Assure proper use and maintenance of research equipment;

Identify other areas of necessary research and communicate them to the research administrators.

Approximate Duration: Four years.

Appendix 3

PUBLICATIONS OF THE AGRICULTURAL ECONOMICS SECTION REVIEWED BY EVALUATORS:

1. Pervis, D. W. 12/81 (Revised 3/82). "An Analysis of the Introduction of the Eicher Tractor into Malawi."

2. Pervis, D. W. 1/82. "Proposal for Irrigation of Research Land at Chitedze Agricultural Research Station."

3. Pervis, D. W. 3/82. "Comments on Unit Farms at Chitedze, Bvumbwe Kasinthula and Mbawa Research Stations."

4. Agricultural Economics Section. 3/25/82. "Economists and Agricultural Economists in Malawi."

5. Agricultural Economics Section. 11/82 (Revised 12/4/82). "Agricultural Economics Data Bank Standards."

6. Pervis, D. W. "A Preliminary Report on the Economic Analysis of District Maize Trials." Presented at the Workshop on Planning Methodology held at the Capital Hotel, Lilongwe, January 17 to 20, 1983.

7. Nthakomwa, B. R. Undated. "Economic Evaluation of Powertiller vs. Oxen for Rice Production in Malawi."

Related Publications Reviewed by Evaluators:

1. Chikwana, R. 10/82. "Economic Behavior of Smallholder Farmers in the Lilongwe Rural Development Project of Malawi." (An M.S. Thesis Proposal).

Appendix 4:

PUBLICATIONS OF THE FARMING SYSTEMS ANALYSIS SECTION REVIEWED BY EVALUATORS:

1. Hansen, A. 9/81. "Farming Systems Research": Theory and Practice in Malawi." Presented in September at Chitedze Research Station and in October at Bvumbwe Research Station.

2. Hansen, A. 3/82. "Five Kawinga Farming Systems." Presented at a meeting at Liwonde ADD.

2. Hansen, A., E.N. Mwango and B.S.C. Phiri. 7/82. "Farming Systems Research in Phalombe Project, Malawi: Another Approach to Smallholder Research and Development." Presented at International Conference on Development in Malawi in the 1980s. Zomba, Malawi. Presented again at the November monthly meeting of Blantyre ADD management to assess implications of this research to Phalombe.

4. Hansen, A., 11/82 "Research-Extension Linkages." Written as part of the USAID team effort in conceptualizing the proposed USAID-funded Agricultural Research and Extension Project. Lilongwe, Malawi.

5. Hansen, A. 11/82. "Generation and Use and Data about Smallholders." Written as part of the USAID team effort in conceptualizing the proposed USAID-funded Agricultural Reseacrh and Extension Project. Lilongwe, Malawi.

6. Hansen, A. 1/83 "Farming Systems Research and Adaptive Research Programs: How May They Help Programme Managers Plan and Implement ADD Development?" Presented at the First Workshop on Planning Methodology and ADD Participation in Long Range Planning Exercise. Lilongwe, Malawi.

7. Hansen, A. 1/83 "Introduction and Demonstration of Micro-Computer Capability for Agricultural Research at Chitedze-Computer Programs to Handle Farmer Survey Material: 1. A Data Management Program, 2. A Word Processing Program." Presented at First Workshop on Planning Methodology and ADD Participation in Long Range Planning Exercise. Lilongwe, Malawi.

Related Publications Reviewed by Evaluators

1. Kydd J. and R. Christiansen, undated. "Structural Change in Malawi Since Independence: Consequences of a Development Strategy Based on Large Scale Agriculture."

Other Publications not Reviewed by Evaluators:

1. Hansen, A. 3/81 "The LRDP/North East Team Notes for Discussions." Presented around the Ministry of Agriculture and Chitedze to generate initial feedback to the first preliminary farmer surveying.

2. Hansen, A. 4/81 "General Features of LRDP Farming Systems" Presented in a meeting in Lilongwe ADD to assess priorities for project activities and adaptive research.

3. Hansen, A. 8/81. "Report on the Farming Systems Survey Conducted in Phalombe Rural Development Project of Blantyre Agricultural Development Division (BLADD)." Presented at a meeting at Blantyre ADD to assess priorities for project activities and adaptive research.

4. Hansen, A. 10/81 "Intercropping and Farming Systems in Malawi." Presented at the 20th October Intercropping Research Conference at Chitedze Research Station. Drs. Hansen, Edje (Bunda College) and McLean co-sponsored this conference.

5. Bell, K.L. and E.N. Mwango 1/82. "Agricultural Change in Lilongwe Programme Households." Presented at the 23 January Conference on Socio-Economic Research in Rural Lilongwe which was held at Chitedze Research Station.

6. Hansen, A. 1/82 "Farming Systems Research in Malawi and Specifically in the Lilongwe Project Area (LRDP)." Presented at the 23 January Conference on Socio-Economic Research in Rural Lilongwe which was held at Chitedze Research Station.

7. Hansen, A. 3/83. "Farming Systems Research and Women in Malawi." In Proceedings and Materials from the National Workshop on Women in Agricultural Development March 9 - 10, 1982. The workshop was sponsored by the USAID-funded Women in Agricultural Development (WIAD) Project and was held at Chitedze Research Station.