

CLASSIFICATION
PROJECT EVALUATION SUMMARY (PES) - PART I

Report Control: **PD-AAA-657**
Symbol U-447

1. PROJECT TITLE Major Cereals	2. PROJECT NUMBER 263-0070	3. MISSION/AID/W OFFICE USAID/Cairo
	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) 85-10	
<input type="checkbox"/> REGULAR EVALUATION <input type="checkbox"/> SPECIAL EVALUATION		

5. KEY PROJECT IMPLEMENTATION DATES			6. ESTIMATED PROJECT FUNDING equiv. approx.	7. PERIOD COVERED BY EVALUATION	
A. First PRO-AG or Equivalent FY <u>79</u>	B. Final Obligation Expected FY <u>80</u>	C. Final Input Delivery FY <u>85</u>		A. Total \$ <u>66.9 m</u>	From (month/yr.) <u>July, 1979</u>
			B. U.S. \$ <u>47 m</u>	Date of Evaluation Review <u>February, 1984*</u>	

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., program, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
1. Review and reach agreement on a comprehensive Project Logical Framework to be followed by all parties in the implementation of the remainder of the project.	USAID/MOA/CID	November, 1983 (completed as a part of Amendment #4 to the CID contract)
2. Strengthen and institutionalize the integration of research and extension work.	MOA/CID	June, 1985 (PACD) action underway as part of overall MOA efforts to draw research and extension more closely together
3. Improve statistical analysis capabilities and establish a utilizable data base.	CID/MOA	June, 1985 (PACD) action underway - computing center established, staff being trained, data base being planned
4. Emphasize improved management skills in technical assistance.	CID/MOA	June, 1985 (PACD) to date, TA team has been increased and MOA has assigned a counterpart to each TA management

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS			10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT	
<input checked="" type="checkbox"/> Project Paper	<input type="checkbox"/> Implementation Plan e.g., CPI Network	<input checked="" type="checkbox"/> Other (Specify) <u>CID contract</u>	A. <input type="checkbox"/> Continue Project Without Change	B. <input checked="" type="checkbox"/> Change Project Design and/or (agree on logframe) <input type="checkbox"/> Change Implementation Plan
<input type="checkbox"/> Financial Plan	<input type="checkbox"/> PIO/T	<input type="checkbox"/> Other (Specify)	C. <input type="checkbox"/> Discontinue Project	
<input checked="" type="checkbox"/> Logical Framework	<input type="checkbox"/> PIO/C			
<input type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P			

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)	12. Mission/AID/W Office Director Approval
Sidney Bowers, AGR/A <i>SB</i> Arnold Radi, AGR/A <i>arn</i> Raymond Fort, AD/AGR <i>RF</i> 2/26 Norman Sweet, AD/DPPE <i>NS</i> 4-7 Arthur Handly, DD <i>AH</i>	Signature <u>M.P.W. Stone</u> Typed Name <u>M.P.W. Stone, Director</u> Date <u>2-28-84</u>

AID 1330-15 (3-78)
*USAID/Cairo delayed in reviewing and approving this evaluation in anticipation of further revisions of the report by the team. These revisions were not forthcoming.

CLASSIFICATION
PROJECT EVALUATION SUMMARY (PES) - PART I

Report Control
Symbol U-447

1. PROJECT TITLE Major Cereals (con't)	2. PROJECT NUMBER	3. MISSION/AID/W OFFICE
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)		
<input type="checkbox"/> REGULAR EVALUATION <input type="checkbox"/> SPECIAL EVALUATION		
5. KEY PROJECT IMPLEMENTATION DATES	6. ESTIMATED PROJECT FUNDING	7. PERIOD COVERED BY EVALUATION
A. First PRO-AG or Equivalent FY _____ B. Final Obligation Expected FY _____ C. Final Input Delivery FY _____	A. Total \$ _____ B. U.S. \$ _____	From (month/yr.) _____ To (month/yr.) _____ 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
5. Complete construction as soon as possible.	MCA	To date, all project construction contracts have been signed and construction initiated; seed processing building completed; all other construction to be completed in 14 mths
6. Establish inventory and receiving system for commodities.	CID	completed and functioning
7. Establish a financial status reporting system for the project budget.	CID	completed and functioning for both dollar and LE budget
8. Complete current seed processing and production activities; increase efforts to strengthen seed production and distribution systems within project purview.	MCA/CID	Seed building complete; equipment being installed; staff being trained in U.S.

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS <input type="checkbox"/> Project Paper <input type="checkbox"/> Implementation Plan e.g., CPI Network <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Financial Plan <input type="checkbox"/> PIO/T _____ <input type="checkbox"/> Logical Framework <input type="checkbox"/> PIO/C _____ <input type="checkbox"/> Project Agreement <input type="checkbox"/> PIO/P _____	10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT A. <input type="checkbox"/> Continue Project Without Change B. <input type="checkbox"/> Change Project Design and/or <input type="checkbox"/> Change Implementation Plan C. <input type="checkbox"/> Discontinue Project
--	--

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)	12. Mission/AID/W Office Director Approval
	Signature
	Typed Name
	Date

2

NEAR EAST EVALUATION ABSTRACT

PROJECT TITLE(S) AND NUMBER(S) Major Cereals (263-0070)	MISSION/AGRY OFFICE USAID/Cairo
--	------------------------------------

PROJECT DESCRIPTION: The purpose of this project is to establish a capacity to develop and provide to the farmers of eight pilot governorates the technology needed to increase cereal, forage and grain legume production. This purpose is to be achieved through strengthened research and extension skills and improved links between research and extension that will in turn demonstrate increased yields to farmers and policy makers.

AUTHORIZATION DATE AND U.S. LOP FUNDING AMOUNT 7/79 \$47 million	PES NUMBER 83-10	PES DATE February, 1984*	PES TYPE <input type="checkbox"/> Regular <input type="checkbox"/> Other (Specify) <input type="checkbox"/> Special <input type="checkbox"/> Terminal
ABSTRACT PREPARED BY, DATE Emily Baldwin, DPPE/PAAD <i>EB</i> January 29, 1984	ABSTRACT CLEARED BY, DATE <i>Arnold J. Radi</i> Arnold Radi, AGR/A Sidney Bowers, AGR/A		

This evaluation was performed in May, 1983 by a four member team (two Egyptians from the Ministry of Agriculture, plus an AID TDY and a Personal Service Contractor from a U.S. university). This is the first AID-sponsored evaluation (although the TA contractor, CID, had sponsored an "internal" evaluation six months earlier), and represents the mid-term evaluation as called for in the project design.

Overall, the team found the project to be making "excellent technical progress," although they acknowledge that "much remains to be done." A number of delays in implementation have occurred, many of them not unique to this project: construction, commodity procurement, customs clearance, and insufficient numbers of participant trainees due to lack of adequate English language capability. Despite these delays, however, significant progress has been made on research results. While the report seems to indicate that progress has not been as good in strengthening the extension aspects of the project and in bringing the research work more meaningfully and productively to the farmer, the team did find that the links between research and extension have been strengthened by the project and that there is considerable enthusiasm for these links among participating staff and farmers. As a result, at the time of the evaluation, the project was reaching 2,025 villages with over 12,000 farmers. In addition, small farmer demonstration fields have shown significant yield increases.

Unfortunately, the report is long on reporting the technical, research aspects of the project and rather short on detailing specific project problems and proposed solutions. It also is weak on making connections between aspects of the project. As a result, it is difficult to derive an overall sense of eventual project impact and the means to enhance that impact in the remaining life of project. *make up of the team*
no need to discuss this report, do it again

Lessons Learned
The report does not detail any lessons learned and does not seem to be comprehensive enough to yield meaningful lessons with any certainty. Nonetheless, improved links between extension and research in an effort to reach farmers with better, more relevant and timely information is obviously an important means by which to increase crop yields as well as to increase the enthusiasm and interest of all participants.

*Although this evaluation was performed in May, 1983, USAID/Cairo did not finalize the report until January-February, 1984. This was because there were several points of clarification that had been requested of the team in the draft report; these clarifications were not forthcoming, and, after many months, the USAID decided to go ahead with the report as it was in draft.
do it again

October 17, 1963

John Yche
S&T/AGR
U.S. Agency for International Dev.
Washington, DC 20523

Dear John:

It has been several months now since you and Fred Mann were here to evaluate the EMCIP project. We appreciate your efforts and the information that you provided from the evaluation. In retrospect, however, we are having some problems with the form of the report —i.e., we are finding some gaps and some discontinuities in the presentation of the information that are making utilization of the information difficult if not impossible. For this reason, I am hoping that we can prevail upon you to give us a little more of your time in pulling some things together in the report. I realize that this is an imposition on you and that we have no real incentive to offer. Nonetheless, we hope we can interest you in a little extra time to help us out with the following problems with the report:

1. Summary - Section III is entitled "Summary of Findings and Recommendations," yet very little of a general summary is available in this section. Part A of Section III should be expanded to explain why "the project is making excellent technical progress." How, for example, do the various project components (research and extension, training, seed production, etc.) fit together? Which components have facilitated progress? Which have inhibited it? More importantly, is the project making institutional progress? (i.e., is it achieving the stated purpose?) In the opinion of the Mission, Section III.A should be expanded to discuss how all of the project pieces contribute to a project whole and what exactly that "whole" is. We also believe that Section III.B ("Findings and Recommendations for Specific Program Areas") can be deleted. This section is not sufficiently specific or analytical to be useful. (Section III.B.2 — "CID International Evaluation" (Internal)—should be expanded into a separate section on methodology that also discusses the evaluation methodology used by you and Mann.)

2. Progress - Section IV ("Progress to Date") is very uneven in presentation. Some subsections discuss "accomplishments" while others do not; some discuss "accomplishments" without comparison to original expectations while others do compare. These problems are particularly acute and glaring in the first two subsections — (A) Research and

Extension and (B) Commodity Programs -- exactly where the information is most critical to enhanced project performance and to new program design. Nowhere in section IV.A is there mention of what has been accomplished in research and extension; only the objectives (expectations) are given, without comment on progress or achievements. The "constraints" section as a result is unconnected. If progress and achievements are not known, discussion of constraints and recommendations to remove them mean nothing. In Section IV.B, "accomplishments" are discussed, but without reference to original objectives (expectations); therefore, the figures are meaningless. What should we have expected to be accomplished by now? Are the accomplishments stated in the report better, worse or the same as we had projected?

3. Design - A good deal of space is given over to an "integrated" Logical Framework, yet the team makes no comment on the validity and adequacy of this revised design (this despite the statement on page 20 that the purpose of the evaluation is to "look at project design and implementation in order to ^{make} adjustments needed to improve chances of the project reaching successful completion"). Are all these components necessary and sufficient to achieve the project's purpose? Is the logframe logical? Is it reasonable for AID to expect that the stated objectives will be achieved within the given LOP?

I am certain that you and Fred Mann possess the information requested above; therefore I hope that some adding, rearranging and deleting will not be too burdensome a request for you. I regret that we have waited so long to ask you for these changes and hope that you can find the time to help us increase the utility and impact of all the work you have done so far.

Sincerely,

Emily Baldwin
Evaluation Officer
USAID/Cairo

DPPE/PAAD:EBaldwin:mf:10/12/83
Doc:0341P
Disc:00025B

Clearances:

AD/DPPE, N. Sweet
AGR/A, J. Swanson



AID MIDTERM EXTERNAL EVALUATION OF THE EGYPTIAN MAJOR CEREALS
IMPROVEMENT PROJECT

(EMCIP)

May 10, 1983

EMCIP PROJECT

TABLE OF CONTENTS

	PAGE
I. Background	1
A. Project Evolution	1
B. Current Project Status	4
C. Project Logical Framework and Implementation Plan	6
D. Recommendation	6
II. Purpose of Review	20
III. Summary of Findings and Recommendations	20
A. General Conclusions	20
B. Finding and Recommendations by Specific Program Areas	21
1. Research/Extension Integration	21
2. CID Internal Evaluation	21
3. Program Modification	21
4. Training	23
5. Construction	23
6. Commodities	23
7. Project & Financial Management	24
8. University Grants	24
9. Mechanization	24
10. Cost Effectiveness of Technology	24
11. Center Development	24
12. Seed Processing & Production	25
IV. Progress to Date, Problems and Recommendations	25
A. Research/Extension Facilities	25
B. Commodity Research Programs	26
1. Wheat/Barley	26
2. Maize/Sorghum	28
3. Food Legume Program	30
4. Forages	31
C. Support Programs	33
1. Training	33
2. Soil and Plant Nutrition	35
3. Farming Systems Research	36
4. Economics and Statistics	38
5. Construction	40
6. Commodity Procurement	40
7. Mechanization	42
8. Seed Production	42

D. Extension Program	45
1. Research/Extension Linkages	45
2. Demonstration Plots	45
3. Diffusion Studies	46
V. University Grant Programs	40
VI. Effectiveness of Project Management	49
A. Project Management and Personnel	49
B. Financial Management	50
VII. Cost Effectiveness of Technology Being Extended to Farmers	51
A. Analysis and Conclusions	51
B. Recommendation	54

Activities Recommended for Sector Program Support

A. On a declining support basis:

1. Operating costs (other direct costs) of R/E Center-EMCIP operations.
2. Operating costs of Extension demonstration plots program.
3. University Grants program.
4. Continuation of in-country training program.
5. Improvement of certified seed production, certification and distribution system (esp. for wheat, barley, food legumes and forages) at RE Centers. (Need support for Seed Dept., MOA).
6. Consolidation and expansion of data processing and data base (research, production, socioeconomic).
7. Support to collection of socioeconomic information on a continuing basis, i.e., sample surveys and farm records.

B. On a full support continuing basis:

1. Ph.D. degree and post doctoral training in U.S. and short term nonacademic training.
2. Intensive English training in Egypt for potential training candidates.
3. Extension equipment (audio visuals, etc.).
4. Short-term TDY support and selected long term expatriate advisors.
5. Drainage and Irrigation upgrading at Sids and Shandoweel.

ACKNOWLEDGEMENT

The team would like to acknowledge the assistance provided by The Agricultural Research Center (ARC) and the Egyptian Major Cereals Improvement Project (EMCIP) and EMCIP Staff, the Consortium for International Development (CID)/Executive Office and USAID/Cairo. The work could not have been completed without the openness and support from these groups.

Special thanks goes to Dr. Ali Abdel-Aziz and his staff in the Agricultural Research Center. Both Dr. Abdel-Aziz and Dr. Dessouki, former Director General, should be commended for the progress being made toward achievement of project goals.

Thanks are extended to the Research/Extension Centers for their hospitality. For background and other assistance, the team is indebted to Dr. Keith Roberts, Chief of Party of EMCIP/CID-NMSU (New Mexico State University) and Dr. John Swanson, USAID project manager for EMCIP..

From Dr. John Yohe and Dr. Fred Mann, the American Team members, we are especially appreciative of the professional, collegial relationship we shared with our Egyptian counterparts, Dr. Kira and Dr. El-DiDi.

AID MIDTERM EXTERNAL EVALUATION OF THE
EGYPTIAN MAJOR CEREALS IMPROVEMENT PROJECT
(EMCIP)

May 10, 1983

I. Background

There has been an active program of maize and wheat research in Egypt for many years. As early as 1969, CIMMYT (with Ford Foundation funding) was providing resident advisors to Egypt in maize and wheat research.

A. Project Evolution

In 1977, the Government of Egypt (GOE) became interested in establishing an expanded comprehensive national maize and wheat research and production program. They requested design assistance from USAID/Egypt. The EMCIP project evolved from this request.

A Project Identification Document (PID) for the project was approved in mid-1977. The Consortium for International Development (CID) was selected to provide project design assistance under the collaborative assistance mode and completed its report in March, 1979. A project paper (PP) was prepared and approved and a grant agreement for the project was signed in mid-1979. A Host Country Technical Services Contract for implementation was finalized between CID and the GOE/Ministry of Agriculture (MOA) on January 2, 1980.

According to the PP, the "purpose and principal focus of the project is to develop/provide significant knowledge and expertise prerequisite to increasing cereal production by approximately 25% in eight Governorates." This purpose is to be achieved by development of new technical information concerning cereal production, development of new cultivars with increased yield capability, establishment of an integrated research - extension system, testing and adoption of mechanization for Egyptian conditions, and providing technical and advanced training for personnel involved in the project.

Four cereal crops were to be included: Wheat, Barley, Maize and Grain Sorghum.

The project provided the following AID funded inputs for achieving project purposes:

1. Ten long-term expatriate specialists (including a chief of party) in a wide range of disciplines, plus 30 person months per year (PM/YR) of short-term specialists, and 24 PM/YR of campus backstop specialists, as well as campus coordination and management staff (\$9.1 million).
2. Long and short-term technical (60 persons) and academic (30 persons) training abroad, and in-country on-the-job training (for 282 trainees) (\$2.0 million).

3. New construction of office/laboratory/library facilities at three locations and new apartments/shop facilities at two locations, as well as renovations of existing structures at two locations (\$3.7 million).

4. Commodities, including vehicles, field research and laboratory equipment, office and training equipment and supplies, and library materials (\$8.7 million).

5. Funding for other direct costs such as support staff, computer services, vehicle operating expenses, and research and extension program operating expenses (\$2.7 million).

GOE input commitments included 33 central office professionals, 177 field center professionals, 160 village agents, 185 support staff, and land for research at five locations.

Total AID funding was for \$30.0 million and total GOE funding was for \$9.94 million. Outputs called for were:

1. A restructured major cereals research/extension system (Wheat, Barley, Maize, Grain Sorghum).
2. Proven and functioning strategies for reaching farmers with improved technology.
3. An improved seed production and distribution system.
4. An accessible appropriately processed research and information data base.

In the original Technical Services Contract, CID was responsible for providing long and short-term technical assistance, participant training (both in-country and abroad) imported laboratory equipment and supplies, and other direct costs for logistic support. The MOA was to contract directly for construction of facilities and for procurement of field equipment, office equipment and vehicles. In subsequent amendments to the CID/MOA contract, CID accepted responsibility for procurement of all project commodities (Feb. 19, 1980), and for all construction of facilities (Aug. 15, 1980). An expatriate Business Management Specialist position also was added in the first amendment.

In March, 1980, the CID chief-of-party and three specialists arrived in Egypt to begin EMCIP operations. Three additional specialists arrived during the remainder of 1980. In addition, 21 PM of short-term technical assistance was provided in Egypt during 1980.

In August, 1980, USAID prepared an amendment to the original project paper (PP) to include additional inputs and activities. This amendment was developed jointly by USAID, MOA and CID with the assistance of a four-person design team provided by CID, and technical information drawn from three studies that had recently been completed (by INTSOY, Winrock International, and British Overseas Development Ministry).

The amendment was intended to "increase the technical coherence of the project and to meet the need for technical soundness within each activity." (P. 28 of amendment no. 1 of PP).

The amended project was authorized in August 1980, an amended project agreement was signed on September 28, 1980, and an amended CID/MOA technical Services Contract was signed on February 14, 1981.

The amendment added the following activities to the project:

1. Forage Research/Extension program (Berseem clover, introduction of new forage crops).
2. Grain legume Research/Extension program (Lentils, chickpeas, soybeans and minor legumes, but excluding fava beans)
3. Incorporation of farming systems into the research and extension programs.
4. Four seed cleaning plants at the research/extension centers to satisfy research needs and needs for production of foundation seed.

In addition, adjustments were made in the research/extension program in major cereals.

Outputs for the overall project as amended, were specified as follows:

1. Incorporation of farming systems into the research/extension programs.
2. An integrated research/extension program for cereals, grain legumes and forages.

Six "Sub-outputs" also were specified:

1. An ongoing program of research, capable of continuing development and provision of new technologies to farmers.
2. An ongoing program of extension to farmers, closely integrated with the research program and tied to farmers' needs.
3. Improved technologies tested and distributed to farmers in the eight plot areas and ready to be applied on a larger scale.
4. A proven strategy for reaching farmers suitable for application throughout the research/extension system.
5. Trained Egyptian research and extension personnel, and
6. An institutional base capable of maintaining the programs begun under the project.

Additional inputs provided by AID under the amendment totalled \$17.0 million for the following:

1. Five additional long-term expatriate specialists, a construction supervisor and 72 PM of short-term specialists (\$4.4 million).
2. An additional 35 persons were to receive long- and short-term training abroad (\$0.6 million).
3. Construction of additional laboratories, offices and staff houses (\$2.4 million).
4. Seed cleaning equipment and additional vehicles, extension equipment, field machinery, lab equipment and office equipment (\$1.7 million).
5. Funds to provide research grants to Universities carrying out research with cereals, legumes, forages and related areas (\$1.7 million).
6. Other direct operating costs of the programs (\$2.1 million).

The GOE was to provide an additional 122 research staff and 165 technical and support staff, as well as \$300,000 of funding for the University grants program.

Three additional long-term expatriates arrived in Egypt during 1981, and approximately 65 PM of short-term assistance was utilized. By mid-1982, another four long-term specialists had arrived, for a total of eleven. By October, 1982, 16 of the total of 17 long-term positions were staffed. 24 PM of short-term assistance were provided in Egypt during 1982.

B. Current Project Status

As of May 1, 1983, the project is organized around six research programs, four programs for upgrading research/extension centers, an extension program, a training program, a university grants program and an EMCIP communications program (See table A). The project is administered jointly by the Egyptian Director General of the ARC and the expatriate (CID-NMSU)* Chief of Party.

Each program is jointly managed by an Egyptian professional (program leader) and an expatriate counterpart (program specialist) except the University Grants program that operates with a Grants Committee, with an Egyptian chairman, and an expatriate manager; and the communications program with an expatriate editor.

New Mexico State University (NMSU) has served as U.S. Coordinator of the project on behalf of CID. As such, NMSU is responsible for expatriate staff recruiting, all U.S. dollar procurement, coordination of arrangements for U.S. training, and other U.S. support services. NMSU and CID are jointly responsible for overall financial and technical management of the project.

*Consortium for International Development-New Mexico State University

Table A - EMCIP Programs, Management Teams and Professional Staff

Management & Teams Leadership

Program area	Program Leaders	Program Specialist
A. Research Programs		
1. Wheat and Barley	Dr. Rashad A. Abou El Enein	Vacant
2. Maize and Sorghum	Dr. A. Ismail	Dr. B. C. Williams (acting)
3. Food Legumes	Dr. A. Nassib	Dr. K.G. Cassman
4. Forages/FSR	Dr. A. Kamman	Dr. J. Thomas
5. Soil/Plant Nutrition	Dr. B. Sh. Zikri	Dr. B. C. Williams
6. Economics/Statistics & FSR	Dr. Basheer	Mr. R. Lidh Ms. Coleen Brown
B. R/E Centers Upgrading Program		
1. Construction	Eng. E. Yassin	Mr. Martin Whalen
2. Mechanization	Mr. Ahmed El Behery	Dr. Floyd Matthews
3. Seed	Dr. A. Mansour (acting)	Dr. Glenn Carnahan
4. Irrigation/Drainage and Water Management Research	Mr. H. Wanis Dr. W. Misenha	Dr. E. Foerster Dr. E. Foerster
C. Extension Program		
	Dr. A. Momtaz	Mr. Brookey Dr. R. Dobson
D. Training Program		
		Dr. J. L. Graves
E. University Grants Program		
	Dr. Bahir Oteifa, Committee Chairman	Mr. R. J. Foote, Manager
F. Communications Program		
		Mr. R. J. Foote, Editor

C. Project Logical Framework and Implementation Plan

The logical framework matrix in the original PP included only a part of the purposes and outputs specified in the PP text. Another partial log-frame matrix was included in PP Amendment No. 1. These two log-frames were never integrated, nor did they completely reflect the content of the PPs. Thus, to date they have served little useful purpose for project management. The Internal Evaluation carried out in November, 1982 made an attempt to integrate the two log-frames.

A revised combined log-frame is included as Table B. This combined log-frame synthesizes appropriate elements of project descriptions in the PP and amended PP, as well as the operational plans of the original CID/MOA contract, and Amendment No. 3 to that contract.

Implementation plans were provided in the original PP, as well as the amended PP. These were never integrated into a coherent whole, nor was an implementation plan specified in the grant agreement or the technical services contract. CID was required by the original CID/MOA contract to prepare Quarterly Reports of progress and plans of work for the ensuing quarter. This was changed to an annual plan of work requirement in the contract amendment of Feb. 14, 1981.

The first annual plan of work was prepared for the period September 1, 1981 through December 31, 1982. This plan of work contained time phased implementation schedules for major activities of most programs.

A plan of work also was prepared for calendar year 1983. This plan of work used a standardized format providing a listing of activities with time tables by program unit and specified objectives within the program unit. The present system used by EMCIP of developing time tables for activities in terms of achievement of specified objectives appears to be a reasonable means of tracking progress.

Table C provides a comparison of the activities (or milestones) time table in the original implementation plans with dates these milestones were actually achieved (or are projected to be achieved), and estimated impact of delays in achieving some activities.

D. Recommendation

EMCIP and USAID should review the combined log-frame proposed herein and assure its conformance to the agreed upon magnitudes of outputs, purposes and indicators of achievements of the project. Once approved, EMCIP should proceed to assure that the means of verification for indicators of achievements and magnitudes of outputs are being generated through appropriate objective reviews and studies and summaries of project records. EMCIP, MOA and USAID should agree on what studies, record summaries and reviews are required for this purpose.

**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Life of Project: _____
 From FY _____ to FY _____
 Total U.S. Funds: _____
 Date Prepared: _____

Title & Number: Egypt Major Cereals Improvement Project (EMCIP)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes: (A-1)</p> <p>To increase small farmer production and income from basic field crops</p>	<p>Measures of Goal Achievement: (A-2)</p> <ol style="list-style-type: none"> 1. Achieve a 10% yield increase nationwide in cereal grains and grain legumes covered under the project 2. Increase small farmer incomes in pilot areas by 15 - 20% 	<p>(A-3)</p> <ol style="list-style-type: none"> 1a. GOE annual yield data b. project evaluations 2. appropriate studies based on sample surveys of sources and changes in small farmer incomes in pilot areas. 	<p>Assumptions for achieving goal targets: (A-4)</p> <ol style="list-style-type: none"> 1. Other required inputs will be available to small farmer in a timely manner 2. Favorable market incentives will prevail for target crops 3. GOE will continue to emphasize small farmer development and production of target crops.

17

**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Life of Project _____
 From FY _____ to FY _____
 Total U. S. Funding, _____
 Date Prepared: _____

PAC

Project Title & Number: _____

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Purpose: (0-1)</p> <p>To establish a capacity to develop and provide to the farmers the technology needed to increase cereal, forage and grain legume production, with pilot program in eight governorates.</p>	<p>Conditions that will indicate purpose has been achieved: End-of-Project status. (0-2)</p> <ol style="list-style-type: none"> 1. An ongoing integrated program of research and extension exists, capable of developing and providing new technologies relevant to farmers' needs 2. Improved technology tested and distributed to farmers in eight pilot areas. 3. A proven and operational extension strategy for reaching farmers with the selected technology is in place and functioning. 4. Yields of cereal grains increased by 25%, and of food legumes and forages by 10%, in governorates with project pilot areas; yield increases of 20% for food legumes and forages by farms within the pilot areas. 	<p>(0-3)</p> <p>Project evaluations (indicators 1-3)</p> <p>Appropriate sample surveys and field studies (indicators 2-4)</p>	<p>Assumptions for achieving purpose: (0-4)</p> <ol style="list-style-type: none"> 1. GOE and AID maintain commitment to the project mode of assistance. 2. Trained participants fill positions commensurate with their training and capability. 3. Project elements are sustained within a viable institutional framework. 4. Seed production bottleneck will be overcome by a follow-on project or other activities in a timely manner. 5. Interdepartmental coordination and cooperation will be adequate.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Title & Number: _____

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>(C-1)</p> <p>Restructured Research/ Extension System in place and operating in terms of:</p> <p>a. An improved process for identifying problems and issues in research</p> <p>b. An improved process for public administration of cereal, grain legumes and forages research and extension programs.</p> <p>c. An integrated programs of research and extension</p> <p>Improved and expanded cereal, grain legumes and forages research and extension programs in place and operating in terms of:</p> <p>a. Trained research staff</p> <p>b. Trained extension staff</p> <p>c. Established research and extension centers</p>	<p>Magnitude of Outputs: (C-2)</p> <p>1. System operating in eight governorates</p> <p>2. a & b: Total participants= 407 Trained by 11/84 LT abroad = 30 ST/in-country = 282 ST/ abroad = 60 LT/ST abroad by amendment 35</p> <p>2. c: Four centers; one central office; 68 Governorates extension offices in place</p> <p>d: sufficient to be appropriate for different production conditions in Egypt</p> <p>e: significant adoption rates for new varieties and improved cultural practices achieved.</p>	<p>(C-3)</p> <p>(applied to all outputs)</p> <p>GOE and Project records and appropriate summaries thereof</p> <p>2. Project evaluations</p> <p>3. Project progress reports</p> <p>4. Site inspections</p> <p>5. Sample surveys and field studies as appropriate</p>	<p>PAGE _____</p> <p>Assumptions for achieving outputs: (C-4)</p> <p>(applied to all outputs)</p> <p>1. GOE agricultural agencies will recognize the benefits of and support and integrated research and extension program</p> <p>2. Trainable (including language competency) staff will be identified in timely manner</p> <p>3. Land for center establishment will be provided in timely manner</p> <p>4. GOE incentives are sufficient to assure adequate seed production and utilization</p> <p>5. Universities will support research grants programs</p> <p>6. Institutionalization remains a clear and supported objective of the project</p>

**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Life of Project _____
 From FY _____ to FY _____
 Total U.S. Funding _____
 Date Prepared: _____

Project Title & Number: _____

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Outputs: (C-1)</p> <p>d. Improved varieties and production practices developed and continue to be developed.</p> <p>Information on new varieties and improved cultural practices being disseminated in an effective, continuing manner to farmers.</p> <p>Extension strategies for reaching farmers developed and being implemented:</p> <p>a. Trained village and district agents working in program.</p> <p>b. On-farm demonstrations of improved varieties and production practices being carried out on a continuing basis.</p> <p>Improved seed production technology and seed distribution system developed and functioning effectively:</p>	<p>Magnitude of Outputs: (C-2)</p> <p>3a. Program extension agents assigned in eight governorates.</p> <p>b. Demonstration activities being carried out in eight governorates.</p>	<p>(C-3)</p>	<p>Assumptions for achieving outputs: (C-4)</p>

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project, _____
From FY _____ to FY _____
Total U. S. Funding, _____
Date Prepared: _____

Project Title & Number: _____

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Outputs: (C-1)</p> <ul style="list-style-type: none"> a. Trained professional and technical staff in place b. Improved field inspection procedures being applied c. Improved seed processing facilities in operation and processing all research and foundation seed needs. d. Improved and reliable seed distribution system in operation. <p>Research production and socio-economic data base for cereal, grain legumes and forage programs statistically analyzed, summarized and stored in effectively accessible computerized form.</p> <p>Farming systems dimension will have been incorporated into the research and extension programs for cereal, grain legumes and forage crops.</p>	<p>Magnitude of Outputs: (C-2)</p> <ul style="list-style-type: none"> 4a. See 2a. & b. above. b. In eight Governorates c. Improved facilities at four research/extension centers in place and operating effectively d. Operating in eight Governorates <ul style="list-style-type: none"> 5. Micro-computer center installed and operating at a capacity sufficient to analyze and store all program data. 6. Dimension functioning in all programs* 	<p>(C-3)</p>	<p>Assumptions for achieving outputs: (C-4)</p>

* Recommended for modification

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: _____
 From FY _____ FY _____
 Total U.S. Funding: _____
 Date Prepared: _____

Project Title & Number: _____

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Outputs: (C-1)</p> <p>7. A University grants program to support project-related research will in place and functioning.</p> <p>8. An agricultural mechanization program relevant to cereal grain legumes and forage crops production will be in place and functioning</p> <p>9. An institutional base capable of maintaining the improved system will be in place and operating</p>	<p>Magnitude of Outputs: (C-2)</p> <p>7. Grants totalling 2.0 million equivalent will have been completed.</p> <p>8. Research equipment will be properly maintained; appropriate machinery for farm use will have been tested.**</p> <p>9. National Research/Extension system will be organized and staffed according to system developed in program</p> <p>**Recommended for deletion</p>	<p>(C-3)</p> <p>7. Grants project reports and grant committee reports.</p>	<p>Assumptions for achieving outputs: (C-1)</p>

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: _____ to FY _____
From FY _____ to FY _____
Total U.S. Funding: _____
Date Prepared: _____

Project Title & Number: _____

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTION
<p>Project Inputs: (D-1)</p> <p><u>USAID:</u></p> <p><u>Technical Assistance</u></p> <p>Team Leader Research Specialists Consultants Backstop Personnel</p> <p><u>Training</u></p> <p>Long-term Short-term In-country</p> <p><u>Construction</u></p> <p>Office/Laboratories/Housing</p> <p><u>Commodities</u></p> <p>Vehicles, field Research and laboratory Equipment and supplies; Office and training Equipment and supplies; Library books and periodical subscriptions.</p>	<p>Implementation Target (Type and Quantity) (D-2)</p> <p>See detailed budget</p>	<p>(D-3)</p> <p>USATD records/GOE records</p>	<p>Assumptions for providing inputs: (D-4)</p> <p>AID, GOE, contractor & suppliers provide goods and services on time as required.</p>

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: _____
From FY _____ to FY _____
Total U.S. Funding: _____
Date Prepared: _____

of Title & Number: _____

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Inputs: (D-1)</p> <p>Other Costs:</p> <p>budgetary support computer services, secretaries, etc.</p> <p>Inflation Allowance</p> <p>Contingencies</p> <p>E</p> <p>Training Support salaries and</p>	<p>Implementation Target (Type and Quantity) (D-2)</p> <p>See detailed budget.</p>	<p>(D-3)</p> <p>USAID records/GOE records</p>	<p>Assumptions for providing inputs: (D-4)</p> <p>AID, GOE, contractor and suppliers provide goods and services on time as required</p>

Table C. Original Project Implementation plan for major milestones, actual date achieved (or projected), months of delay, impact of delay and prospects for achievement (dRGP)

Program Input milestones 1/	Date planned	Date Achieved (or projected)	Difference (months)	Impact of Delays on project progress	Prospects for achievement by end of project period	Comments
1. pp approved	6/79	5/79	--	--	--	
2. Grant agreement signed	7/79	7/79	--	--	--	
3. Project Director General appointed	8/79	1/80	5	minor	--	
4. Technical assistance contract signed	9/79	1/80	4	minor	--	
5. Team leader COP arrives	10/79	3/80	5	minor	--	
6. 3 long term technicians arrive	11/79	3/80	4	minor	--	
7. Major Cereals Directorate established	11/79	3/80	4	minor	--	
8. Central office staff appointed	12/79	3/80	3	minor	--	
9. 2 additional long term technicians arrive	1/80	6/80	5	minor	--	
10. One additional LT technician arrives	3/80	7/80	4	minor	--	
11. Team members selected for training	3/80		-	--	not possible for academic training	short-term nonacademic training progressing satisfactorily

25

cont.

Table C. Original Project Implementation plan for major milestones, actual date achieved (or projected), months of delay, impact of delay and prospects for achievement (ZNGIP)

Program Input Milestone 1/	Date planned	Date Achieved (or projected)	Difference (months)	Impact of Delays on project progress	Prospects for achievement by end of project period	Comments
12. One additional LT						
team member arrives	5/80	7/80	2	minor	--	
13. R/E Staff posted	5/80	5/80	--	--	--	
14. Maize & Sorghum						
seed beds prepared						
(first time)	5/80	5/80	--	--	--	
15. Constructing A&E						
work completed	6/80	5/83	33	major	good	need additional funding
16. PP amendment						
approved	8/80	8/80	--	--	--	--
17. Amended grant						
agreement signed	9/80	9/80	--	--	--	
18. Field Equipment in						
place	9/80	9/80	--	--	--	Continuing activity
19. Wheat & Barley seed						
bed prepared	9/80	9/80	--	--	--	--
20. Two additional LT						
technicians arrive	10/80	7/80	--	--	--	--
21. Contract amended to						
conform amended PP	11/80	3/81	4	minor	--	lost in AID until 12/81

26

Table C. Original Project Implementation plan for major milestones, actual date achieved (or projected), months of delay, impact of delay and prospects for achievement (RHCIP)

Program Input milestone 1/	Date planned	Date Achieved (or projected)	Difference (months)	Impact of Delays on project progress	Prospects for achievement by end of project period	Comments
22. Final technicians arrive (per amendment)	1/81	3/81, 4/81, 9/81, 2/82, 6/82, 7/82, 8/82, 9/82	2 - 20	significant	—	7
23. Construction started at all sites	3/81	5/82	16	major	good	need additional funding achieve construction objectives
24. Team members selected for training (as per amendment)	2/81	2/81	—	—	not good for academic	partial
25. OOR staffing finalized (as amended)	3/81	continuing	—	—	—	Lack of appropriate staff has been a problem in isolated cases
26. Project reorganization completed	3/81	continuing	—	—	—	—
27. Amended field and lab						
28. Grant program criteria & selection committee finalized	4/81	3/82				amendment lost in AID until 12/81
equipment ordered	3/81	3/81				continuing

2

Table C. Original Project Implementation plan for major milestones, actual date achieved (or projected), months of delay, impact of delay and prospects for achievement (ENCIP)

Program Input Milestone 1/	Date planned	Date Achieved (or projected)	Difference (months)	Impact of Delays on project progress	Prospects for achievement by end of project period	Comments
29. Demonstration plots						
Initiated	6/81	6/81	--	--	--	
30. First External						
evaluation	9/81	9/81	--	--	--	
31. Equipment arrives						
(amendment)	9/81	continuing after 4/80	--	--	--	continuing amendment lost
32. First University						
grant awarded	9/81	7/82	10	minor	good	in AID until 12/81
33. Construction						
completed	11/81	9/84	33	major	good	if additional funds are available
34. Training						
completed	11/83	6/87				last long term academic participant expected to be sent 9/83 and will require 4 years.*
35. Post project evaluation						
completed	4/83	4/83				
36. Production goals						
reached for wheat, maize, barley, and grain sorghum	12/84	12/84				
37. Production goals						
for Legumes	12/84	12/84				

28

Cont.

Table G. Original Project Implementation plan for major milestones, actual date achieved (or projected), months of delay, impact of delay and prospects for achievement (EHCIP)

Program Input Milestone 1/	Date planned	Date Achieved (or projected)	Difference (months)	Impact of Delays on project progress	Prospects for achievement by end of project period	Comments
----------------------------------	-----------------	------------------------------------	------------------------	--	---	----------

38. Institutional

goals	12/84	12/83				
-------	-------	-------	--	--	--	--

39. Extension

goals (organization)	12/84	8/83				
----------------------	-------	------	--	--	--	--

1. First 35 milestones are those specified in the implementation plans of the PP and the amended PP milestones 36 - 39 were specified by EHCIP Chief of Party.

* Delays in selecting academic participants has resulted in delays in reincorporation into project.

22

II. Purpose of Review

The original review design in the PP and the review design in Amendment No. 1 were based on a number of key hypotheses about the relationships among research, technology, information diffusion and the resultant increased ability of small farmers to increase output. The original design team apparently felt that, given the availability of data and information and the number and abilities of research personnel presently working in Egypt, the Project should be directed toward organizational restructuring and extension type activities as well as research per se. In other words they felt that given current levels of technology and by initiating research for improved technology; by testing techniques for disseminating information; by developing a person to person interface between extension subject matter specialists and researchers, and by training and placing extension personnel to work at the village level, activities could be initiated to overcome problems of technology improved production practices.

The review plan in the original project paper provided for internal, annual and special (external) reviews. Internal reviews were to be handled by the contractor and used to monitor progress towards project outputs and purpose. The annual reviews were to back up the internal review, but would involve additionally MOA/AID staff and limited outside reviewers. Contractor staff were not to participate in preparing the reports of annual reviews.

Special reviews as described in Amendment No. 1 would be external in nature, in that the contractor would not participate in the drawing of conclusions or in preparation of the final report. Two special reviews were scheduled, one in year three and one in year five. This review is the first of the two special reviews. The purpose of the review is to take an external look at project design and implementation in order to make adjustments needed to improve chances of the project reaching successful completion. The review is to be used as a management tool by USAID Egypt to assess progress, and to determine mid-stream corrections which may be helpful to reaching end of project goals. The purpose is not to find fault but rather to assess utilization of resources, and progress to date, and to make recommendations for changes in direction that will insure successful completion of all project activities.

III. Summary of Findings and Recommendations

A. General Conclusions

The project is making excellent technical progress. In the first several months of the project, there were a number of chronic management problems, but in the past few months these have been partially resolved (on commodity procurement, physical inventory management and construction). However, much remains to be done.

There have been delays in commodity procurement construction as well as the the filling of some long-term expatriate positions. These delays have not significantly affected technical progress of the project. The original design team in assuming that construction, R/E center upgrading,

29

and field and laboratory equipment would be necessary for the generation of technology, apparently did not recognize the quantity and quality of on-shelf technology available. By creating the research/extension linkages and initiating the demonstration programs, progress toward the achievement of project objectives got underway virtually from the outset, without the need to await generation of additional technology.

B. Findings and Recommendations for Specific Program Areas

1. Research/Extension Integration:

The project has already been successful in achieving integration of research/extension at both the research level and in the field. This can continue to grow in strength but to do so, it must be a major focus for the remainder of the project life.

The MOA has integrated the ARC and the Agricultural Extension and Rural Development Research Institute into one new organization called the Agricultural Research and Extension Center (AREC). This has been encouraged by several different independent initiatives. They are:

- a. Research/Extension Integration by EMCIP.
- b. U.S. Extension Study Team Report, November 1981
- c. U.S. Presidential Commission Report on Agricultural Development in Egypt, July, 1982.
- d. Strong Support by Management of EMCIP, ARC, Extension and Rural Development Institute, and the MOA.

2. CID International Evaluation:

The CID November 1982 Internal Evaluation was quite comprehensive and identified several areas that need special attention. This review is based on the CID review and other factors as follows:

- a. AID Documents
- b. EMCIP Documents
- c. Field Visits
- d. Intensive discussions with project personnel in USAID, EMCIP, ARC, and the Research/Extension Centers (R/Cs)

This is an extremely complex project to be evaluated by a 4-person team in 4 weeks, however because we benefited from the internal evaluation and from frank and open insights of project personnel, we were able to identify critical areas of progress and major problems yet to be resolved in order to achieve planned end-of-project (EOP) status.

3. Program Modification:

We do not see the need for major adjustments in any of the ongoing project components except for:

- a. Farming Systems Research
 1. Under Egyptian conditions, it would be more appropriate to build a farm and home management capability into extension service, including the initiation of farm and home record keeping systems.
 2. Intensification research (intensify from 190% annual cropping cycles to 300%). A goal for the MOA is to move toward 300% intensification of cropping systems. We recommend development of crop intensification trials at the R/E Centers. It is feasible to achieve three crops per year under certain cropping conditions. This is a research problem and cannot be resolved in on-farm tests.
- b. Statistical analysis and establishment of utilizable data base
 1. Install micro computer terminals.
 2. Expand Center capability to include research data word processing and administration of accounts.
 3. Place terminals where easily accessible to technical staff.
- c. Expatriate team composition beyond current long-term tours of duty.
 1. We found that the Egyptian professional staff at all levels are highly motivated, technically competent, and experienced.
 2. Because of the considerable technical progress made to date, we feel the long-term expatriate positions required are primarily in management areas. We would suggest that as present tours of duty permit, the long-term expatriate staffing should be as follows:
 - i) Chief of Party
 - ii) Business Manager
 - iii) Physical Inventory Control & Management Specialist
 - iv) Seed Production/Processing Specialist
 - v) Construction Coordinator
 - vi) Extension Management Specialist
 - vii) Research Management Specialist
 - viii) R/E Center Farm Manager
 - ix) Convert Production Economist to Farm Management/Production Economist. The work of the Production Economist should be terminated. It should be expanded with greater Egyptian staff input.

For additional technical assistance, key short-term scientists can be recruited as needed. This mode would allow recruitment of senior, experienced scientists.

4. Training:

a. The major problem is to assure available funds for long-term academic students in the U.S. and assuming earliest departure for those programmed who are leaving in 1983 to complete their studies. Possible solutions would be to:

- a. Extend training part of contract;
- b. Commit funds from other resources.

b. AID and the MOA should continue intensive English training in Egypt for EMCIP staff and should also work out procedures for EMCIP candidates w/TOEFL scores of 350-400 (but otherwise qualified) to go to the U.S. and finish their English training there.

c. AID should consider continuing long-term academic training in U.S. on a continuing basis beyond the commitments of this project.

5. Construction:

Although there has been a delay of more than two years in planned construction, it has not significantly affected the technical progress of the project. However, construction is a key input into the research/extension system to assure continuation of progress in the future. We feel that because the construction program has been designed and being implemented as an integrated and coherent effort, it should be brought to completion, quickly as possible under the project. Every effort should be made to find resources to cover the cost overruns involved.

6. Commodities:

Problem areas include:

- a. procurement procedures,
- b. receiving & inventory procedures,
- c. distribution to original requestors/purposes.

Commodities procured has caused the most consternation of any component of the project. An inventory/receiving system that is accountable to both the Director General and Chief of Party should be established soon. A purchasing system that tracks from requestor through delivery and assignment of the commodities at the project level must be established.

7. Project and Financial Management:

We could find no system by which U.S. dollar budget status was provided in a timely manner to the Chief of Party (COP) and the Director General for management purposes. Financial data has been available to the COP on an annual basis, based on cumulative expenditures at the end of a calendar year and the proposed future year budget.

It appears that at no time has financial status been reported showing cumulative forward commitments (personnel contracts, bids, TDYs, etc.). This has contributed to the current financial crisis facing the project..

The contract specifies that the COP is the contractor's legal representative in Egypt. It is imperative that he have financial data available at any given point in time to make rational management decisions. It is even more important for him to be able to inform the Director General of the financial status of the project.

8. University Grants:

Although behind schedule, it appears to be off to a good start. Close monitoring from now to EOP is imperative. If project performance on part of the Universities is satisfactory, AID should seek ways to extend funding this exciting innovation. The universities need at least a third and fourth year for purposes of replication and verification of many of the research activities undertaken by the grants.

9. Mechanization:

a. There is a lot still to be done to assure efficient and effective mechanization of the R/E centers. The problems are recognized by EMCIP and steps are being taken to resolve them.

b. Considering the mix of resources, and other AID projects, the small farm mechanization research activity called for is not appropriate for this project. This objective should be deleted from the project.

10. Cost Effectiveness of Technology:

We found two studies that provide some preliminary information on cost effectiveness of technology (for wheat and lentils). These suggest that unit variable costs of production under recommended technology are 15-20% less than under traditional production. This is a reasonable proxy for relative profitability using recommended practices.

Additional studies are in process and should be continued and intensified throughout the remaining life of the project.

11. Center Development:

Activities as planned should continue, and additional resources should be sought as required. Irrigation and drainage development is critical to future research as new production technology is developed.

12. Seed Processing and Production:

Activities as currently planned should be brought to completion as quickly as possible. Ways must be found to strengthen certified seed production and distribution beyond the R/E centers.

IV. Progress to Date, Problems and Recommendations

A. Research/Extension Facilities

The plan of work was designed to accomplish the following objectives:

- (1) To strengthen the link between research, extension and farmers.
- (2) To inform farmers of the recommended practices and to demonstrate to them the resulting increase in yield and net return.
- (3) To measure yield increases and resulting increases in net returns per feddan under the recommended practices as compared to those traditionally used by farmers at the same sites in other fields.
- (4) To provide agricultural policy makers with proof of output increases based on research/extension efforts and resulting increases in net income per feddan.

The present extension organization is staffed by one program leader, two deputy program leaders, one assistant program leader at the Center office (Giza), 4 R/E Center team leaders, about 60 subject-matter specialists located at the 4 R/E Centers, 10 governorate extension leaders, 81 District Agronomists, and 405 village level advisors.

Each of the four R/E Centers (Sakha, Gemmeiza, Sids and Shandaweel) is responsible for two Governorates. In addition, Sharkiya governorate was added to Gemmeiza R/E Center, and Fayoum Governorate to Sids R/E Center.

The recent expansion of the extension organization is projected to reach 2025 villages, half of the villages in Egypt. This means a ratio of one village advisor to five villages with 810 thousand farmers, one of the lowest ratios based on a recent FAO report.

The 1982 program included a 5-day block of training for the 81 District Agronomists. Sessions were conducted at the Sakha R/E Center for District Agronomists in lower Egypt, and at Sids R/E Center for those working in upper Egypt. Village advisors received five days of training at their respective Governorates.

The main purpose of such meetings with District Agronomists and Village Advisors is to cover extension philosophy and methodology, and technical subject matter on crops and on how to apply the improved technology.

Field days were conducted at 14 production demonstration plots in eight Governorates and at two R/E Centers. Attendants were participant farmers and other farmers.

Based on results achieved by EMCIIP, through integration of research and extension, some decisions have been taken relating to integration of the Extension Department and the ARC of the MOA in recognition of the importance of strengthening links between R/E and farmers.

Constraints to achievement of objectives are:

- (1) Field staff are limited in their programs with farmers due to a lack of transportation.
- (2) Educational programs with farmers are limited because of a lack of visual aid equipment.
- (3) Continuous training programs must be institutionalized to keep present staff up-to-date and train new staff as they join the project.
- (4) Present training facilities at R/E Centers are inadequate.
- (5) Supply of high quality seed for new and improved varieties of cereal and legume crops is needed by farmers and extension workers for demonstration.
- (6) Lack of qualified staff for out of country academic and non-academic training.
- (7) Extension staff lack specific extension technical knowledge.

B. Commodity Programs

1. Wheat and Barley Program

a. Accomplishments

- (1) This unit operates at five Centers. Each Center now supports an independent breeding research effort aimed at specific problem areas-

- Giza: coordination and basic research;
- Sakha: rust resistance and salt tolerance;
- Gemmeiza: rust; low N requirements;
- Sids: stress physiology and aphids;
- Shandaweel: durum and aphids.

Approximately 60 feddans of research fields are planted each season at each of the four main Centers and ten feddans at Giza.

(2) Varietal development-

Five new bread wheat varieties were released to farmers and extension groups, i.e. Giza 157, Sakha 8, Sakha 61, and Sakha 69, which out yielded the standard variety, Giza 155, by 15 to 20%. Three new 6-row barley varieties were released, i.e. Giza 121, C.C. 163, and C.C. 89.

The durum variety, Stork, was released in upper and middle Egypt.

(3) Testing program for testing promising lines-

A natural series of four types of yield tests are established:

-Separate A-trials for each of bread wheat, durum, and barley consisting of 64 entries one planted in eight locations each year. Each Center submits 15 top lines each year to this A-trial.

-Separate B-trials for each cereal (including triticale) consisting of 32 advanced lines from the A-trials are grown in 15 environments each year.

-Separate D-trials for each cereal with 16 entries from the B-trials are grown in 30 environments each year.

-From different yield trials in 1981/82 season, five new lines were detected having 5 to 10% yield increases over the new standard variety, Giza 157. Also, five new durum lines with 5% increases in yield over Stork, and five barley lines with 13 to 17% increases in yield over Giza 121 are selected and being increased.

(4) Physiology, cytogenetics, salt tolerance studies, and breeding for pest resistance-

A new section was established in 1980 to cover plant physiology, cytogenetics, and pest resistance. Two laboratories were completely rebuilt and equipped for cytogenetics and lysine biological assays. A third laboratory was started for tissue culture and physiology.

(5) Entomology-

Entomology research was started in the 1981/82 season. One phase covers an integrative pest management program for wheat and the second deals with aphid control and research on resistant cultivars. Aphids are becoming an increasingly serious problem, particularly in middle and upper Egypt.

(6) Cereal quality research-

Equipment for a new cereal quality laboratory has been ordered.

(7) Agronomy research-

Research being conducted on agronomic and cultural practices in wheat and barley to define and test a proper production package for newly-released varieties. In the 1981/82 and 1982/83 seasons mechanization trials were emphasized. A total of 108 agronomy trials were conducted in 1981/82.

Major conclusions from wheat agronomy trials are maximization of yields by adding 60 to 75 Kg N per feddan, and the use of a seeding rate of 45 Kg per feddan with mechanical planters instead of a seeding rate of 60 to 75 kg per feddan required for broadcast planting. For barley, recommended N is 30 to 45 kg per feddan.

(8) Seed production-

The Wheat and Barley Program has been responsible for coordinating, supervising, implementing, and harvesting all phases of wheat and barley seed production on EMCIP and State farm land during the last three years. This seed is contracted and is to be handled by the Seed Production Department of the Ministry of Agriculture. In both 1980/81 and 1981/82 a total of 3,500 feddans of wheat and 900 feddans of barley were planted and harvested by the program on the State farms.

(9) Extension Linkage activities-

- (a) Developed and supplied the total wheat package applied to demonstration fields which increased grain yields by 50% and straw yields by 30% on small farmers holdings.
- (b) The Project in 1982/83 involves 2025 villages directly covering 11,263 feddans, and about 12,150 farmers.
- (c) In 1982/83 mechanized fields for small farmers of 25 feddans each were planted in 15 locations.

b. Constraints

Constraints to optimum progress include:

- (a) Lack of adequate English for out-of-country training.
- (b) Delays of construction.

2. Maize and Sorghum Program

On-station experimental plots, as well as on-farm demonstration fields show that yields at least twice as much as those of the national average for maize and sorghum can be obtained if local varieties are replaced with new improved ones and nutrient management is provided. Thus, self-sufficiency in maize and sorghum for Egypt is a reasonable goal.

a. Accomplishments

- (1) A new maize variety, Giza 2, was released and its area increased from about 2000 feddans in 1981 to almost 175,000 feddans in 1982.
- (2) Newly developed maize hybrids, DC 202 and DC 208, confirmed their superiority over Giza 2. Several tons of seed of those hybrids were produced during 1982.

- (3) A new maize composite showed great promise for commercial production. Its yield performance is as good as that of Giza 2.
- (4) A disease nursery for screening against the maize late wilt disease was established at Sakha, providing for development of resistant varieties.
- (5) A total of 235 entries out of the maize germplasm collection were seed increased.
- (6) The agronomy trials revealed the importance of a planting application of N, also the superiority of irrigation in long furrows over the commonly used small basins for either maize or sorghum.
- (7) A short sorghum variety, NES 1007, proved to be promising to serve as a dual purpose variety for both forage and grain. It is suitable for northern and desert regions, tolerant to salinity and drought conditions, and resistant to many diseases.
- (8) A newly-released sorghum variety, Giza 15, was the top yielder in demonstration plots in Assiut and Sohag governorates. Average yields were 25.3 and 28.8 ardaps per feddan for Assiut and Sohag, respectively.
- (9) A total of 430 feddans will be used for foundation seed production of newly-released maize and sorghum varieties and hybrids. These will be the base to cover at least 1,000,000 feddans with improved seed by 1985.
- (10) In cereal technology, work is continuing the improvement and enhancement of the blending of cereal grains to assist in reducing import deficits and improve quality of products.

A laboratory for isozyme and protein analyses was set up.

- (11) In development of extension linkages, maize demonstrations in 1982 were designed to plant about 100 feddans in each of the 67 Districts in the original eight governorates. In addition, 50 feddans of demonstrations were planted in each of the nine Districts of Sharkiya governorate. The total number of aggregates was 335 plots divided among 240 villages involving 6,209 participant farmers.

Sorghum demonstrations were planted in two upper Egypt Governorates, Assiut and Sohag. Approximately 679 feddans were planted in the 18 districts. Plots were divided among 30 villages in 33 blocks with 663 participant farmers.

b. Constraints

Constraints to optimum progress include:

- (1) Lack of necessary equipment and apparatus, shortage of chemicals and greenhouse space, in addition to a nonfunctioning pathology laboratory which has hindered pathology research activities.
- (2) Lack of seed dryers and storing facilities caused the loss of sizable amounts of foundation seed.
- (3) Slow release by customs of imported project equipment and materials has delayed implementation of project activities.
- (4) Delays in construction including housing, laboratories, irrigation, and drainage.
- (5) The seed production and processing program has not yet achieved adequate production of certified seed. This limits promotion and use of certified seed by farmers.

3. Food Legume Program

The food legume program has focused on three grain legume crops, namely, soybean, lentils, and chickpea. Both lentils and chickpea are traditional high protein food sources in the Egyptian diet. Soybean is a relatively new crop in Egypt and, although it is not presently used as a human food source, after processing it provides a good quality cooking oil and a high protein meal.

In 1981 the Food Legume Program was incorporated into EMCIP's original contract under Amendment No. 3. The stated objective is to increase food legume yields 10% in farmers' fields through an integrated research/extension effort. A second objective is to identify agronomic practices which increase real farm income that farmers obtain from the food legume crops.

a. Accomplishments

- (1) New varieties of soybean (Columbus), lentils (Fa 370), and chickpea (Fa 88 and NEC 1131) have shown consistent 10 to 15% yield increases over the presently used commercial varieties when compared in advanced yield trials throughout Egypt. Seed of these varieties are now being multiplied.
- (2) 1982 Extension linkage activities included soybean demonstrations on some 600 feddans in eight governorates. Participating farmers obtained an average 28% yield increase over control farmers. A locally produced inoculum was used in all on-farm soybean demonstrations.

Similarly, participating lentil farmers in Assiut Governorate achieved a 26% yield increase when compared to farmers following traditional practices.

- (3) Research plots of 10 feddans were allocated to the Food Legume Program at each Center for a permanent soybean/wheat rotation. An unfertilized barley crop was planted in December in these

permanent plots to allow assessment of soil heterogeneity. In the past, continual relocation of soybean research plots each year has prevented a concerted study of soybean nodulation problems. The establishment of these permanent plots will greatly improve the soybean research program.

b. Constraints

Constraints to optimum progress include:

- (1) Lack of nodulation in most soybean field experiments and in on-farm demonstrations. This results in the need for high rate of nitrogen fertilizer application and eliminates the "advantage" legumes have over non-legume crops.
- (2) Poorly equipped and inadequate laboratory facilities severely restrict inoculum production/quality testing and agronomy research.
- (3) Farmers participating in on-farm trials are not following all recommended management practices.

4. Forage Crops Program

The forage crops program was added to EMCIP in Amendment No. 3 to the contract to provide technical expertise, research expertise and research experience for the forages program at ARC, Sakha, Sids, Shandaweel, and Gemmeiza. Long range effects are anticipated in increasing the amount and quality of forage during summer months when berseem cannot be produced and when cotton, wheat, rice, corn are regulated by Government policy.

a. Accomplishments

(1) Berseem breeding-

- (a) Seventy high yielding ecotypes were selected from 377 lines accumulated from farmers throughout Egypt as having some potential in breeding. The selected ecotypes were grown in the 1982/83 season and intensively evaluated for agronomic and productivity characteristics. Fifteen ecotypes will be selected on a yield basis in comparison to the best variety in use which presently is Miskawi, and selected plants will be allowed to cross. Seed will be saved and planted in 1983/84 as a seed increase under isolation for a new synthetic variety.
- (b) Seed for three new varieties developed in a previous breeding program is being grown at Sids, Giza, and Sakha on a total of 14 feddans.
- (c) Berseem breeding lines resistant to common major soil-borne and foliar diseases have been selected and will be used in a recurrent selection program.

(2) Forage sorghum breeding-

Hybrids of forage sorghum/sudangrass are being developed using male sterile grain sorghum lines as females. General and specific combining ability has been determined and seed stock production is planned for 1983. Additionally 45 new A and B lines for hybrid breeding evaluation have been received, plus 34 O.P. varieties for adaptation trials.

(3) Alfalfa breeding-

A breeding nursery of more than 1000 plants was established at Nubaria (new lands) to select for a synthetic variety resistant to diseases and insects and having persistence and high yield. This is the first time a synthetic has been produced in Egypt. Another new variety, "Sewa", has been developed and seed is being increased in 1983 on 40 feddans at Nubaria.

(4) Fodderbeets-

Fodderbeets show great promise as a winter crop. Yields up to 100 tons/feddan green weight have been obtained.

(5) Agronomy studies-

Agronomy studies on forages include intercropping, fertility studies, inoculation studies, seeding rates and spacing, cutting dates, etc. Results indicate a need for NPK on grasses and PK on legumes. Mixtures of grasses, small grains, and legumes (berseem) are promising for increasing dry weight, and diet balance, but mixtures with fava beans are promising for seed production of single-cut berseem.

(b) Extension linkage activities-

A program for berseem clover started for the first time in the fall of 1982. Its main feature was the planting of berseem and barley as a mixture. Demonstration plots were planned for each of the 81 Districts in the 10 EMCIP Governorates. Preliminary information indicates that an increase in milk production was noted, and higher first-cut yields of forage were measured.

b. Constraints

Constraints to optimum progress include:

- (1) Equipment for field and laboratory work which have arrived from the U.S. are held in stores for a long time before release is possible.
- (2) Local purchase procedures are tedious.
- (3) Equipment and supplies are slow in arriving.

(4) Vehicles are inadequate.

C. Support Programs

1 Training

a. Status

The project called for training 282 in-country trainees, 30 long-term academic participants and 60 short term non-academic participants abroad. An additional 35 long and short-term participants abroad were added by PP Amendment No. 1. EMCIP prepared a training plan calling for 9 MS participants () months each), 17 Ph.D.s (36-48 months each) and 18 post-Ph.D.s (one year each).

The PP (and amendment) proposed initiating the long-term training in 1980 and 1981. At present (May 1983), six Ph.D.s and 1 MS candidate have been sent to the U.S., and 15 short-term trainees to third countries.

- (1) By the end of 1982, a total of 16 persons had received short-term training in the U.S. and three in third countries. Plans are to send an additional ten long-term participants for degree training in 1983, 30 short-term trainees to the U.S. and 15 short-term trainees to third countries.

It is apparent that training abroad has lagged considerably behind the planned timetable. This means that program activities have less opportunity to utilize trained people during the project period.

A serious constraint to both short and long-term training abroad has been lack of candidates with sufficient proficiency in the English language. It was not until mid-1982 that steps were taken to provide English tutoring to potential candidates. 60 EMCIP Egyptian staff completed at least one of our 32 hour English training courses in 1982. English training will be continued during 1983. Some 200 staff are expected to receive basic English training, and 30 will receive intensive training during 1983.

It is not likely that more than 14 long-term academic participants will be sent under the project. However, some 95-100 staff will have received short-term training abroad by the end of the project, substantially in excess of the number programmed. At least ten long-term academic participants will not have completed their degrees by the end of the project period.

- (2) Performance in in-country short-term and on-the-job training has been more impressive than abroad training. A comprehensive training plan was approved in 1982. Through 1982, some 20 expatriate scientists had spent a total of 42 PM in Egypt assisting in in-country training, and seven more provided assistance to date in 1983.

Only limited in-country training was carried out from March 1980 to July 1982. From August-October 1982, the following training activities were carried out:

Hours & type of training	Number & Type trained
1. 18 hours in project administration	40 extension personnel: program leaders, deputy program leaders, expatriate personnel, etc.
2. 30 hours of extension/technical training	Governorate extension program leaders, R/E center program leaders, expatriate staff
3. 80 hours of ext/technical training	100 District extension personnel
4. 20 hours of ect/technical training	400 village advisors

A monthly cycle of in-country training is planned and being executed for 1983, similar in scope and intensity to that carried out in late 1982. This will be for 40 staff members; 30 extension leaders, 81 district extension personnel, 405 village advisors, 125 subject matter specialists and researchers and 125 support staff.

Some 15,000 to 20,000 small farmers receive direct training annually through demonstration plots on their farms, and others through meetings with village advisors, farm visits, field days, rural T.V. programs and extension publications.

b. Constraints and Recommendations:-

- (1) Intensive English training should be continued in Egypt, even for staff not likely to go for long-term academic training under the present project. Such training will develop a pool of qualified candidates for other USAID funded participation training programs. USAID should recognize the critical value to the future of agricultural development in Egypt and to the interests of the U.S. of graduate degree training in the U.S. for a substantial number of Egyptian agriculture professionals. Those who received graduate degree training in the U.S. during earlier periods now are primarily in their 50's and 60's, with few in their 30's and 40's. Thus, there is a considerable gap of U.S. degree trained Egyptians to participate in agricultural research leadership in the future.

Although the Ph.D. degree in Egypt is of good academic quality, these students lack the opportunity to be involved at the cutting edge of new technology development and to gain experience in hands-on adaptive research in the laboratory and in the field functioning within a practical problem solving context. This, and the diversity provided by degrees abroad, is of supreme importance to Egyptian agricultural development. Furthermore, it is erroneous to seek to have all course work carried out in the U.S. and the degrees granted by Egyptian universities. Those who earn their degrees in the U.S. system deserve the added status provided

by a U.S. degree. On the other hand, it is helpful to carry out at least a part of dissertation research in Egypt if adequate provision is made for appropriate in-country supervision by the major professor or his delegate.

Other innovative activities can contribute to expanding the pool of Egyptians with U.S. academic and research experience. In the short run, Ph.D. candidates in Egyptian universities could take one year of their course work in a U.S. university, combined with participation in research. Also, scientists with Egyptian Ph.D.s can be sent for one year of post-doctoral work in the U.S.

- (2) Arrangements should be made to permit otherwise well-qualified graduate training candidates to go to the U.S. with a TOEFL score of 350-400. They can enter one of several university-sponsored intensive English programs for a semester to one year to reach an adequate score for graduate training, while at the same time taking some remedial courses (especially in mathematics where formal language capability is not critical). Such students can begin their training as non-academic or special students and formally enter graduate school when they achieve acceptable TOEFL scores. Any graduate level courses taken prior to graduate school acceptance will be accepted toward degree credit requirements by most schools.
- (3) Arrangements should be made as soon as possible to assure funding for completion of degrees by long-term academic participants now in the U.S. or being sent during 1983 under the project. This can be achieved by reserving required project funds and extending the termination date of the project for participant training only, or by committing funds from other sources to complete training under way.

Those participants affected are entitled to assurances of the opportunity to complete their training.

2. Soil and Plant Nutrition

- a. Status: The soil and plant nutrition group fulfills a support function to the commodity programs as well as providing assistance to center development at each of the R/Es. The CID internal Midterm Evaluation and Review Team Report reviewed the progress and activities of the group. Early activities have centered more around center development, i.e., working with irrigation and drainage systems and completing comprehensive soil surveys on each of the Centers. The group has also been very active in cooperating with the commodity groups in setting up soil and plant nutrition studies relevant to the individual commodity programs. The group has cooperated closely with the extension leaders conducting programs associated with technology transfer of soil and plant nutrition technology.

The group should be commended for their work on removing constraints that would interfere with research and the productive capacity of the soil and water resources at the centers.

They are at the point where they can begin initiating disciplinary research. However, their first priority must continue to be to work with the interdisciplinary commodity groups. Agricultural production improvement per se will depend on the collaborative research and extension efforts of all disciplines:

b. Constraints:

- (1) Transportation - There are no vehicles assigned to the soil and water group. This has created problems for subject matter specialists in monitoring their research and extension efforts.
- (2) Training - Since the project is primarily a commodity oriented project, there have been no slots approved for long-term academic training in soil or plant nutrition disciplinary research.
- (3) Delays in laboratory construction and in importation and customs release of research equipment has been a problem.

c. Recommendations:

- (1) Assign a vehicle to each subject matter specialist group at each R/E Center or develop a motor pool capacity at each center where transport needs can be met for all research groups.
- (2) In follow-on activities to this project, long-term training should be provided to selected disciplinary scientists assigned to work on the interdisciplinary commodity research team.
- (3) The delays listed in constraint (3) are being resolved and will cease to exist as laboratories are remodeled or are included in new construction. Equipment for laboratories is arriving in country and EMCIP management is working on improved systems for receiving, recording in inventories and distributing to appropriate project activities.

3. Farming Systems Research

a. Status: The PP Amendment No. 1 added three additional areas of activities to the EMCIP project; (1) farming systems, (2) forages and (3) grain legumes. The discussion here will deal with farming systems research (FSR). FSR technology has evolved out of experiences of development in countries where extension was poorly developed or non-existent. Research was not responsive to small farmer needs. There were no systems for identifying what constraints small farmers and small farm families faced in making decisions about what crops to grow, what new technology to adopt, or how to allocate limited resources in order to minimize risk. Thus, in the context of the holistic view of FSR, PP Amendment No. 1, proposed that a farming systems unit to be established in the Major Cereals program; and that it would be staffed with extension agents working in the EMCIP program who would be trained in the FSR approach in order to increase their understanding of the nature of changes in the farming system. Initial activities of the farming systems unit were conceived to include collection of micro-data at the family,

farm, village, district, and governorate levels to determine attitudes of the farmer and his family in order to try to understand the farm family decision making progress.

In State cable No. 162415 dated 20 June, 1980, the NEAC review committee in its review of the Amendment No. 1 concepts paper, requested that the term, "Farming Systems", as used in the concepts paper be clearly defined in the PP Amendment. NEAC interpreted the term to mean a farm management approach involving complex rotations, crop/soil relationships and their relation to livestock feed". That was a narrower definition than the holistic approach which was the one adopted by the design team for the Amendment.

In retrospect, as the review team has observed the progress in implementing the FSR activity, it appears that the NEAC committee was perceptive to the type of farming systems approach most appropriate for Egypt. The reasons for this conclusion are:

- (1) The EMCIP project had as one of its major objectives to establish an extension program with closely integrated linkages to research efforts.
- (2) The MOA extension service had capable people on board, but these could not function as effective extension advisory agents because of lack of resources for training, transportation, linkage to research, and because of responsibilities in implementation of Farm Credit Bank regulatory programs. However, under the EMCIP program a large number of these agents were seconded to the project to develop extension information; demonstrations, and a training flow capability for farmers. Under EMCIP, the extension workers have demonstrated their ability to function and to relate to farmers.
- (3) The Extension Service has been administratively moved to the Agricultural Research Center. That organization is now called the Agricultural Research/Extension Center.

The capability and personnel are now in place to establish a Farm and Home management capability within the Extension Service with direct linkages to the five agricultural research/extension centers and the AREC Headquarters in Giza. It seems inappropriate to create another unit such as a special FSR unit which also will utilize the same people in extension and research. A Farm and Home management capability within the extension system would allow extension personnel to set up farm record keeping systems and surveys on how management decisions are arrived at. It could incorporate frequent visitation contact between village farm or home advisors with the farm family unit. Because of the special linkages between research and extension as developed in this project, the Farm and Home management approach would be a way to institutionalize this activity consistent with the capabilities and structural organization of the research and extension systems as now organized.

EMCIP has struggled with how to implement the FSR concept. They have had TDY evaluations of their needs from the "holistic view-point", and

The economics and statistics program has been organized into three types of activities:

- (1) Data processing
- (2) Macro-economic analysis
- (3) Micro-economic analysis (primarily production economics)

Micro-economic data collection and analyses have been carried out for the following:

- (1) Sample survey information: (a) related to yields and costs of production changes resulting from adoption of recommended technologies, and (b) related to adoption rates by type of recommended practices.
- (2) Farm or plot records taken by direct observation to obtain data related to input use, cultural practices, costs and returns for demonstration programs and some field experiments.

Macro-economic work has been limited to selected crop studies reviewing major published statistics relating to area, yields, production, imports, consumption, prices, costs and returns, with analyses of long term trends.

For data processing, two TRS-80 Model II micro-computers and associated hardware have been installed and are operational. Operators have been trained. The Montana State University-STAT (MSU-STAT) statistical analysis package is in use and some data processing of research results by programs is underway.

A comprehensive economics/statistics training program has been approved. Some in-country training workshops have been carried out and several persons have been identified for graduate or post-graduate training abroad.

b. Recommendations: (1) It is important to expand the data processing activity as part of a comprehensive data processing, storage and retrieval system for ARC and MOA. Because of recent technological innovations in user-friendly computer systems, a specialized study of these needs should be made. (2) The economics activities should include farm records collection and analysis and should be coordinated with other farm record activities being carried out in the sector. Farm records data collection and analyses, and sample survey data collection and analysis should be programmed in a way that assures analyses responsive to verification needs to determine end-of-project status in terms of achievement indicators for project goal and purpose, and for output magnitudes. (3) Egyptian personnel need to be assigned to these activities in sufficient numbers to assure adequate data collection and analysis for guiding research and for measuring progress in terms of

18

settled on initiating this method experimentally with the forage program. The review team found serious reservation on the part of both Egyptian research and extension administrators on the potential success of this approach. They do see and understand the potential and appropriateness of the Farm and Home management approach to understanding farm needs in terms of constraints to production in view of various competing crops and enterprises which can return the greatest net income to the farmer from his investment of very limited resources. They see the potential for Farm and Home management advisors to carry out farm and home planning with Egyptian farm families. An important result of farm and home management output is the clear identification of constraints to improved incomes and productivity of the farm family. Constraint identification and technology for resolution flow naturally and frequently through the farm and home advisor and the subject matter specialists who are closely tied to the research process, a process organized to work with farmers in identifying appropriate solutions. This process assumes constraint identification, research awareness, and research/extension subject specialist testing and verification at the farm level.

The Farm and Home management approach also assures extension advisor involvement in working with farm and home planning, which is necessary to introduce socio-economic and management information. The process would introduce record keeping which in turn will be invaluable to the AREC production economics section in evaluation of cost effectiveness and profitability of practices being used in the farm and home business. This involves an action-implementation approach to small farmer needs rather than a research approach which involves a much smaller population of farmers involved.

b. Constraints: (1) Lack of institutional commitment to the FSR concept because of inadequate understanding about the approach in the Egyptian system. (2) The FSR approach chosen is not appropriate in the Egyptian research/extension context. (3) The approach chosen involves institutional layering within programs that requires an additional mode of interaction and cooperation between research and extension to cooperate at levels different than through the research/extension linkages now in place.

c. Recommendations: (1) To introduce farm and home management as a programmatic thrust in EMCIP Extension programs. (2) To train AREC extension specialists in Farm and Home management technology. (3) To use the incentive method, so successfully used in demonstration plot programs, to obtain farm family participation in working with farm and home management advisors in setting up Farm and Home operating records.

4. Economics and Statistics

a. Status: The original project proposed an economics/statistics activity and the amended PP added Farming Systems research. Several activities related to statistical processing of existing and future research findings were to be initiated under the project. Findings from existing research were to be collected and processed during the first year, and subsequent research findings thereafter. Costs for computer services were included. An Economic analysis of research results was called for, as well as other economic analyses relevant to the project.

improved productivity, output and profitability, both at the farm level, and at more aggregated levels. (4) The planned training program in economics and statistics should be a high priority for implementation to assure that adequate staff trained in survey techniques, analytical methods and report preparation are available to generate the needed economic information.

5. Construction

a. Status: The construction program is more than two years behind schedule and cost overruns are likely to be in excess of \$6.0 million. Fortunately, construction delays have not seriously affected technical progress of the project for reasons explained elsewhere, but completion is imperative for continued good progress.

Presently, the construction program is well advanced in terms of planning, and pre-qualification bidding. It is a coherent and integrated program that will assure continuation of high quality research/extension and seed processing facilities at the R/E Centers and Giza for many years beyond the termination date of the project. The facilities can be expected to be well utilized and will contribute significantly to maintain and reinforce the interdisciplinary focus of the research program, and the integration of research and extension.

b. Recommendation: Every attempt should be made to make resources available under the project to fund all construction for which pre-qualification bidding now is in process. Continuity would be adversely affected, probably seriously, if significant cut-backs were imposed or if construction were shifted to other programs for funding. If no delays are imposed, it is likely that construction can be completed and equipment installed by the planned project termination date. Any training required for organization, and operation of facilities after the project termination date can be provided through short term TDY's either from CID or elsewhere.

6. Commodities Procurement

a. Background: Originally, under article VII. C of the schedule and article V of the operational plan of the contract between CID and the Ministry of Agriculture, the Co-Directors (Chief of Party and Director General) of the project agreed to mutually plan, initiate, and follow through with the AID procurement office in the procurement of the vehicles, farm machinery, office equipment and other equipment for the project. The intent of the original contract was for the Ministry to perform the actual procurement of the commodities after the Ministry, Contractor and AID consulted and agreed as to the types, amounts, and specifications for the equipment to be procured.

Amendment No. 1 to the contract designated the contractor (CID) to act on behalf of the ministry in the procurement of commodities. From the budget increase CID agreed to purchase vehicles, farm machinery, office equipment and other equipment for the project, after consultation with the ministry. The original contract called for an expenditure of \$1,155,000 over five years for equipment. The first amendment added an additional

\$8,552,518. Amendment No. 3 to the contract raised the total for equipment purchases to \$ 10,211,348. In order to accommodate this additional responsibility the Ministry of Agriculture agreed to pay the contractor a one-time management fee of 1% or \$ 85,668 for CID/NMSU to serve as the procurement agent. These funds also were to be used for salaries for short-term procurement personnel.

b. Status: The commodity procurement part of this project probably has been the most perplexing and troublesome part of the project from the initiation of purchase requests. It is not necessary to go back and discuss all the problems. Basically they are:

1. No purchasing system.
2. No purchase order numbers issued in Egypt.
3. No files kept on active or completed orders.
4. No Inventory system.
5. No receiving system

From the review team perspective, the above five areas are problems. It appears that there is no reconcilable purchase system. Project management is working on solutions to these problems now. Millions of dollars of equipment are now arriving at the seaport in Alexandria and the project is trying to resolve problems (under great pressure) of receiving, customs clearance, inventory, distribution and reconciliation of purchase orders with packing lists and bills of lading.

Because the local EMCIP office is responsible only for the dollar/ pound account, EMCIP/Cairo has never tried to reconcile purchase requests against budgetary restrictions. The dollar accounts have been maintained at NMSU and at CID. Consequently purchasing has never been under the financial management control of EMCIP and at any given point in time, NMSU/CID have not provided information about funds available for further procurement. Thus EMCIP/Cairo has been unable to advise the Director General about fund balances under individual budget line items in order to establish priorities.

The implication of the inadequate receiving and inventory system, is that the co-Directors (The Director General and Chief of Party) are not in a position to fully account for property received. This may be especially troublesome at the end of the contract when all procurement accounts must be reconciled with inventory accounts and be able to stand an audit

The problem likely stems in part from the effort to reduce procurement administrative costs below that normally charged for such services. This experience should be a clear demonstration that procurement administration is a valuable service, and short-cut low cost alternatives end up costing much more than the funds saved in lowering procurement administrative costs.

c. Constraints: (1) No system for reconciliation of purchases received with purchase order numbers and original requestors. (2) No files kept on active purchase orders. (3) No adequate receiving system. (4) No adequate inventory system. (5) No adequate accounting procedures by NMSU and CID providing regular equipment budget balances against expenditures, commitments, and forward estimates of expenditure against purchase orders in hand or in process.

d. Recommendations: (1) Implement an inventory/receiving system that is accountable to both the Director General and the Chief of Party in order to meet the legal requirements of the CID/MOA contract. (2) Establish a purchasing system which will track purchase orders from requester through delivery and assignment at the project level.

7. Mechanization

a. Status: The PP called for mechanization of the R/E Centers and provided for procurement of agricultural machinery for this purpose. It also called for a research effort to adapt machinery appropriate to the small farmer. Progress and problems related to procurement of farm machinery for the Centers was discussed under "Commodities Procurement."

The machinery program perhaps has been the most seriously affected by delays in the construction program, especially delays in erection and finishing of the pre-fabricated buildings. When these are completed, one at each center will be made into a machinery maintenance and repair shop. In the meantime, space in existing buildings has been upgraded for shop space and for parts stores.

Problems are and will continue to be related to lack of trained personnel for operation, maintenance, and repair of machinery, even after the new shop and parts store facilities become available. The availability of repair parts and their management in the stores also will be a continuing problem. EMCIP is working on these problems through the use of TDY personnel and training activities.

Mechanization staff now is authorized at each Center as follows: one agricultural engineer, two secondary agricultural school graduates and two secondary industrial graduates.

The EMCIP plan of work for 1983 appears to be adequate to move toward resolving mechanization problems at the Centers.

b. Recommendations (1) Considering the mix of resources and objectives of this project and other AID projects related to small farm mechanization, the small farm mechanization activity should be deleted. (2) The EMCIP 1983 mechanization plan of work should be strongly supported by project management.

8. Seed Production

a. Status: The third amendment to the contract between CID and the MOA, which was under the first amendment to the project paper called for EMCIP

to initiate a program of improved seed production. Specifically EMCIP was to initiate a program at the four research/extension Centers to process and clean all seed for research purposes and for foundation seed. Top quality seed is one of the most important yet least costly of the inputs required for successful agricultural production. Farmers may have access to fertilizer, water, pesticides, but without improved seed the potential for improved packages of production practices is severely limited.

The EMCIP project established four key objectives for seed improvement early in the life of the project. They were:

- (1) Supervise the production of foundation seed of wheat, maize, sorghum and barley, food legumes, and forages.
- (2) Purchase, install, and make operational seed cleaning and seed testing equipment at the four research/extension Centers.
- (3) Supervise the processing, treating, testing, and packaging of foundation seed.
- (4) Provide academic and non-academic training for selected personnel on the seed multiplication staff.

In order to fulfill and achieve these objectives it was necessary to:

- (1) Build four new buildings at the research/extension Centers to house new seed processing equipment
- (2) To establish a new central seed testing laboratory at the AREC Center in Giza and to purchase equipment for the central laboratory as well as four seed testing labs at the R/E Centers. The seed processing plants at the R/E Centers are designed to clean all of the foundation seed and registered seed requirements as established by the five year project plan.

Accomplishments have been noted in the EMCIP 1983 plan of work and the proceedings of the third Annual National Executive Committee Meeting held on March 31, 1983. Briefly, these are:

- (1) Construction has started on all seed processing buildings at the R/E Centers.
- (2) The EMCIP seed program organization and procedures have been approved.
- (3) Seed processing and cleaning equipment has been ordered.
- (4) Seed laboratory equipment has arrived in Egypt. It will be stored until new laboratory space is prepared.
- (5) Three seed production specialists have been trained in the U.S. and arrangements are being made to send others.

All inputs necessary for the EMCIP seed program are on track. The system should be complete and in place by the end of the project, provided progress continues.

b. Constraints:

Some of the constraints remaining to be worked on are:

- (1) Mechanization of seed production on the State Farm lands at each of the R/E Centers. This will contribute to the production of uniform quality seed in the field. This includes land preparation, planting, roguing of weeds and off-types, tillage, use of good cultural practices, and harvesting in a timely manner. This is extremely critical for good seed, even before the cleaning and processing procedures are initiated.
- (2) Development of trained personnel at all R/E Centers to supervise proper seed production practices.
- (3) Training of field inspectors to determine seed quality in the field prior to harvest.

These constraints are addressed in the new EMCIP organizational plan for seed production, seed processing, seed field inspection and seed testing.

The PP Amendment also called for an improved seed distribution system. This is underway for maize and sorghum seed. Two new Egyptian private seed companies have been organized to handle the distribution of certified maize and sorghum seed. The R/E Centers will provide registered seed to the seed companies, who will in turn be responsible for certified seed production, packaging and distribution to farmers. The certified seed production of maize and sorghum seed will be accomplished through contract farmer growers managed by the private seed companies.

For certified seed production of wheat, barley, soybeans, lentils, chickpeas and forages, the problem is of a much greater magnitude. The R/E Centers are responsible for producing breeder, foundation and registered seed. All registered seed coming from the R/E Centers is released to the General Department for Seed Production, Ministry of Agriculture. The General Department for seed production in turn contracts with private farmer growers to produce certified seed. The General Department for Seed Production is a unit outside of the AREC and on a parallel with other line functions of the MOA. Thus, the R/E Centers under the AREC do not have any regulatory responsibility over the production of certified seed production. This is where the future success of the EMCIP program and its objectives come face to face with the remaining weak link in the system. The constraints of the General Department for Seed production are many. Generally, they are:

- (1) Manpower - - there are not enough trained personnel to adequately supervise and manage certified seed production fields.

- (2) Mechanization -- there is a total lack of mechanization on certified seed production fields to assure production of top quality seed.
- (3) Seed testing - - There are three seed testing laboratories in the department. They are old, poorly equipped, and lack adequately trained personnel to operate them. Output efficiency is quite low.
- (4) Seed processing plants are old, out-of-date and poorly equipped. Efficiency is very poor. Of the certified seed processing plants in Egypt, seven belong to state farms, and only four belong to the seed production department. Presumably four of the seven seed processing plants belonging to state farms are being replaced with new facilities under the EMCIP program and will be under the control of the R/E Centers. It is unknown to the reviewing team whether the capacity of these new facilities could be large enough to handle certified seed for retail distribution or not.
- (5) Poorly trained field inspectors - - all farmer contract seed growers presently follow traditional practices. Field inspectors are not adequately trained to supervise farmer seed producers.
- (6) Transportation - - There is an inadequate availability of transport for field inspectors to move around in order to supervise the contract certified seed producers. There are 3000 field inspectors who supervise 100-200 feddans of seed production each. Their work is complicated by the small size of fields they supervise.
- (7) Technology transfer to farmers -- Procedures for extension specialists to train field inspectors of the Seed Production Department on technology and methods for training contract farmers on using recommended practices has not been worked out.
8. Training - - There are no Ph.Ds, and only two M.Sc's in the Seed Production Department. All other professionals hold the B.Sc. degree. Only two administrators have attended a seed production short course such as the one offered at Mississippi State University. English capability as a prerequisite for external training is extremely lacking.

In summary, the success of the cereals, grain legume and forage programs seem to in part depend upon the reliability of the MOA Department of Seed Production.

b. Recommendation: The constraints of the MOA Department of Seed Production are outside the scope and responsibility of EMCIP. USAID in future support to the Agricultural Sector in Egypt seriously should consider strengthening and upgrading this critical area.

D. Extension Program

1. Research Extension Linkages

a. Status: An objective of the EMCIP program is to develop and foster research and extension linkages. The internal midterm Evaluation Team Report accurately described the linkages and the areas in which they occur. In this review, it has been obvious that at all levels there is a commitment by all concerned that these linkages should be strengthened. Researchers, extension specialists and village advisors all were enthusiastic about progress being made and the impact they are making through use of demonstration plots. With the on-going success of the EMCIP program, there is a new identity and obvious esprit de corps in extension.

With the merger of Research and Extension, new opportunities for involvement and career development have been recognized. Many research staff have been converted to research/extension positions and seem thoroughly engrossed and excited about their work. The project has been very successful in giving a new image of credibility to extension work in Egypt. The program has chosen to call the village extension workers "advisors" rather than extension village agents. This is to avoid association with the regulatory work most extension workers are associated with outside of EMCIP. Now farmers with experience in EMCIP programs recognize the village advisor as one who can provide him with new ideas and advice that will help him to improve his production of maize, sorghum, barley, wheat and legumes. This was verified in a limited number of contacts with farmers who are cooperating in demonstration plot activities. In the plots the review team visited, there were research and extension workers present who were following the progress of the plots and working with the farmers.

The Ministry of Agriculture is to be commended for bring research and extension together.

- b. Constraints: (1) Lack of audio visual and other training aids for village advisors to use in farmer training sessions. (2) Lack of Transportation for village advisors. There will be different transport problems for women advisors as they begin working in farm homes. (3) Lack of sets of field equipment to be used by Governorate Extension teams in setting out EMCIP mechanized Demonstration Fields.
- c. Recommendations: (1) Within the new agricultural sector support approach to assistance, a line item should be included for continued support for equipment and vehicle needs of the extension service in not only the EMCIP governorates but the rest of Egypt also. (2) If FY 83 year end funds become available, AID should support additional sets of equipment purchases for Governorate extension teams for preparation, planting and harvesting of demonstration plots using mechanization.

2. Demonstration Plots

a. Status: Demonstration plots began with the 1980/81 wheat crop and continued to expand in use as one of the major teaching tools for demonstrating the advantages of new technology to farmers. EMCIP covers 81 districts with 2025 villages. Each district contains 25 villages. There are demonstration fields which cover 5 feddans per

village and one consolidated demonstration field of 25 feddans in each district which is used to demonstrate mechanization practices in crop production.

In 1983, the project will cover 11,262 demonstration feddans of wheat, 91 feddans of berseem mixed with barley and 52 feddans of lentils during the winter season. During the summer season, plans are for the EMCIP program to plant 12,150 feddans in maize, summer sorghum and sorghum, plus 750 feddans of soybeans.

The demonstration program has been very successful to date. For the crop years of 80/81 and 81/82, wheat demonstration plots yielded 62% and 65% greater than the national average for wheat. For maize, the demonstration field yields averaged 42% and 52% greater than the national average for the years of 1981 and 1982 respectively.

The major purpose of the extension program and the demonstration plots specifically is to enable farmers to increase production of cereal crops in the Governorates under the EMCIP program by 25%, and by 20% in all other Governorates. The forages and legumes goal is a 20% yield increase within pilot demonstration districts and 10% in other areas.

b. Constraints: (1) Lack of trained extension workers in and out of project areas. (2) Lack of visuals and teaching aids for conducting farmer training classes. (3) Lack of transport for extension workers in areas outside of project area.

c. Recommendations:

- (1) Allocate resources under new sector funding mode for expanded extension support. (2) Develop expanded training programs in proper extension methods and techniques.

3. Diffusion Studies:

(a) Status: An important tool for improvement of the extension program is a continuing program of studies of farmer adoption of recommended technologies to determine the rate of diffusion and farmer acceptance of recommendations. Such studies also provide information on the most effective methods of transferring technological information to Egyptian farmers. One such study was completed for the extension program during the 1981/82 crop year. It was based on a sample survey of 1,300 farmers (half participating in the Demonstration plot program, and half not) in the pilot areas.

Data collected provides information about knowledge levels of farmers concerning recommended practices and sources of such information. The study indicates that the most effective extension method was demonstration plots, with 40% of the farmers without demonstration plots learning about certain recommended practices from them. Farmers learned from other extension methods in the following percentages:

Extension meetings	8%
Farm visits	3%
Rural T.V. programs	71%
Extension publication	3%
Neighbors (other than those with demonstration plots)	71%

b. Recommendation: Diffusion studies should be carried out on a continuing basis to assure appropriate feedback to extension management personnel for optimizing their extension strategies.

V. University Grants Program

A. Background: The University Grants Program links EMCIP and Egyptian Agricultural Faculties together to contribute to increasing production in the cereal crops, food legumes and forages. Out of \$2.0 million allocated for the program, \$ 1,882,000 has been committed for twenty nine projects conducted by qualified faculty members in nine universities; i.e. Cairo, Alexandria, Ain-Shams, Assiut, Tanta, Zagazig, Mansoura, Fayoum, and Al-Azhar. A technical advisory committee was appointed in August 1982 to:

- Review the projects from a technical point of view.
- Provide service to the research staff as needed.
- Provide guidance on overall policies.

An accounting program has been established at the EMCIP/Cairo office and one person has been assigned responsibility for these accounts. Therefore no financial problems have been raised by most principal investigators.

Requests for five sets of scientific equipment for purchase in the U.S. were sent to NMSU for action in March 1983.

First progress reports covering the period July - December 1982 have been evaluated by the technical advisory committee and EMCIP staff. All were satisfactory. The committee is doing a good job of assuring clear plans of work and complete progress reports.

B. Conclusions

- a. No financial problems are encountered.
- b. Purchases of equipment and apparatus are going according to schedule.
- c. Research work is progressing according to plan and the advisory committee is fulfilling its responsibilities in serving and guiding the grant activities.
- d. Most of the laboratories soon will be furnished and well prepared for implementation.

e. Preliminary indications seem to assure that the University Grant program will take its role as complementary to the EMCIP commodity and support programs.

In terms of the impact on University research capabilities, the University Grant programs have:

1. helped in furnishing the laboratories which lacked equipment and apparatus needed for research.
2. provided opportunities for junior staff to receive both laboratory and field training.
3. provided regional Faculties of Agriculture the opportunity to work on local problems of their own society.
4. provided opportunity for ARC and University staff to exchange views and ideas, a phenomenon which could lead to extensive cooperation and collaboration between the two parties in the future.

C. Recommendations:

Since the program was started in July 1982 field experiments will start this Season (1983) and be replicated in 1984 when the project will be terminated. Results taken from field experiments should be confirmed in the third and in some cases in the fourth year. Therefore a third and fourth year extension of the grants is highly recommended.

VI. Effectiveness of Project Management

A. Project Management and Personnel

The project is making excellent progress. In the early stages of project life, there were a number of chronic problems. However, during the past year much has been done to alleviate those problems. At present, there is a mix of expatriate project personnel who relate well with their counterparts, and creative solutions are being worked out that will solve knotty problems that have delayed progress in procurement, construction and Center upgrading.

The Chief of Party maintains an excellent rapport with the Director-General and counterpart advisors to the project. The Deputy Chief of Party and extension advisors have done an excellent job of creating an awareness (and progress in realizing) of the capability that rests within the extension service. The entire CID team is to be commended for fostering the interdisciplinary approach to research and cooperation with one another. Problems of scarce equipment and other resources could have caused turf problems that could have been seriously detrimental to the project. Instead, all parties have maintained a high degree of professionalism that has set an example for counterpart scientists to follow. Both expatriate staff and Egyptian staff have done an excellent job in creating the research/extension linkages that are so vital to the life-of-project goals. This is illustrated by the

MOA reorganization of research and extension into the same administrative unit. The USAID in-depth review of extension and the subsequent Presidential Mission Report on "Strategies for Accelerating Agricultural Development" helped prepare the level of awareness that allowed the government to have confidence in the working example of EMCIP.

The review team feels that the project, though successful in achieving the objective of research/extension integration at both the research center level and at the field level, can continue to grow in strength. For it to do so, however, research/extension integration must continue to be a major focus for the remainder of the project period.

It should be emphasized that institutional changes which have enhanced integration could not have happened without strong Egyptian support from Management within EMCIP, the ARC, the Extension Institute and the Ministry of Agriculture. The team found that Egyptian personnel at all levels are highly motivated, technically competent and experienced. Because of this and the considerable technical progress made to date, we feel the long-term positions required in the later stages of the project and in post-project follow-ons primarily should be in the management areas.

As tours of duty permit and as future directions for follow-on activities become more clear the team suggests the following types of positions be maintained (and the others be eliminated as long term positions):

1. Chief of Party
2. Business manager
3. Physical inventory control and management specialist
4. Seed production and processing specialist
5. Construction coordinator
6. Extension management specialist
7. Research management specialist
8. R/E Center farm manager
9. Farm management/production economics specialist

B. Financial Management

1. U.S. Dollar Account - We did not find a system by which the U.S. dollar budget status was provided to the Chief of Party and the Project Director General to use as a monthly management tool. It appeared to us that financial data has been made available to the Chief of Party only on an annual basis and was based on expenditures at the end of the project year, the unexpended funds from the previous year's budget and

the proposed future year budget. It appears that at no time has the financial status been reported showing cumulative forward commitments. This probably has contributed to the current financial budget crisis facing the project. The Chief of Party had no projections to discuss with Egyptian counterpart personnel for determining funding implications of project activity expansion or of increased commitments to equipment or capital procurement.

The project contract specifies that the Chief of Party is the contractor legal representative in Egypt. It is imperative that he have forward commitment financial data available at any given point in time so that rational decisions can be made. It is even more important for him to be able to inform the Director General of the projected financial status of the project.

2. U.S. Dollar/Pound Account - There were concerns expressed by all program leaders and counterparts, and R/E Center Directors, about working capital funds being made available for critical project activities. There was a national project leaders' meeting held which the review team attended. In that meeting in which project management, the EMCIP Business Officer, and the USAID project manager were able to announce how procedures, if followed correctly would solve the problems. Forward financial planning is the key to the process. All staff and R/E Center Directors need to plan into the future on program funding needs. If the procedures outlined are followed, there should be no serious problems in the future.

VII. Cost Effectiveness of Technology Being Extended to Farmers

A. Analysis and Conclusions:

Cost effectiveness of technology extended to farmers is measured through reduced unit costs of production. Only limited information was made available to us to compare costs of production and yields of traditional cropping practices with improved cropping practices recommended by EMCIP.

A study carried out by the Agricultural Extension and Rural Development Research Institute (for EMCIP) provides appropriate data for the 1980/81 crop year for wheat. A sample survey was conducted of small farmer operations with demonstration plots being cultivated according to EMCIP recommendations, and of comparable farmers using traditional practices.

That data show the following average relationships for all Governorates sampled for wheat:

Type of plot and sub-product	Yields (per feddan)	Variable costs of production (per feddan)	Percent of income by sub-product (per feddan)*	Output Unit Variable costs of production
1. Traditional practices		L.E. 108.1		
plot: a. Grain	1.44 M.T.		50%	L.E. 37.85 M.T.
b. Straw	2.25 M.T.		50%	L.E. 24.02 M.T.
2. Demonstration plot		L.E. 123.7		
a. Grain	2.20 M.T.		55%	L.E. 30.92 M.T.
b. Straw	2.73 M.T.		45%	L.E. 20.33 M.T.

In conclusion, this study shows that the recommended technology package for wheat is significantly cost effective. As farmers become more familiar with improved technology packages, and as program specialists refine their recommendations, cost effectiveness should increase. For example, as farmers become more proficient at applying the new practices, labor use should decline.

EMCIP publication No. 57^{1/} provides yields, costs of production, income and other data for demonstration plots and traditional plots of lentils. This data was generated from a sample survey of ten farmers who raised demonstration plots of lentils on their farm, agreeing to follow a recommended technology package. These same farmers raised other lentils in the traditional manner. Comparative data was obtained from these plots.

* These percentage shares were used to allocate costs of production as between grain and straw.

^{1/} These data indicate that output unit variable costs of production under improved practices as applied by farmers in demonstration plots, were 81.7% for wheat grain and 84.6% for wheat straw as compared to output unit variable costs of production for plots under traditional practices.

Average cost effectiveness information is as follows:

Type of plot and sub-product	Yields (per feddan)	Variable costs of production (per feddan)	Percent of income by sub-product (per feddan)*	Output Unit Variable costs of production
1. Traditional practices				
plot		L.E. 175.0		
a. Seed	5.0 ardabs	(L.E. 128)	73%	L.E. 25.6
b. Stalks	6.0 loads	(L.E. 47)	27%	L.E. 7.8
2. Demonstration				
plot		L.E. 187.0		
a. Seed	6.7 ardabs	(L.E. 138)	74%	L.E. 20.6
b. Stalks	8.7 loads	(L.E. 49)	26%	L.E. 5.6

* These percentage shares were used to allocate costs of production as between seed and stalks.

^{1/}"An Economic analysis of the 1981/82 lentil production program," by Drs. R. Deuson, A.M. Nassib, E. El-Gamassy and M.A. Rixk, February, 1983.

These data indicate that unit variable costs of production under recommended improved practices as applied by farmers in demonstration plots, were 80.5% for seed and 71.8% for stalks as compared to the same unit costs for other fields of the same farmers using traditional practices.

This study shows, as did the wheat study referred to earlier, that the recommended technology package for lentils is significantly cost effective.

It is our understanding that cost of production, yield, adoption rate and other data have been collected for the other crops in the program and for subsequent crop seasons, both for farmers using traditional practices as well as those using the recommended technology packages. This data will provide continuing information about cost effectiveness. Such data also should be collected and analyzed by individual input yield effects and cost factors to determine which elements of inputs contribute most effectively to reduce unit costs of production.

B. Recommendation

Appropriate data should continue to be collected and analyzed in order to determine impacts of recommended technology packages on output unit costs of production.