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CLASSIFICATION

PROJECT EVALUATION SUMMARY (PES) — PART I

Report Symbol RCS-1

1. PROJECT TITLE	2. PROJECT NUMBER	3. MISSION AID/W OFFICE
Small Scale Agricultural Activities	263-0096	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) 84-13

ISN = 26584-3

☒ REGULAR EVALUATION ☐ SPECIAL EVALUATION

5. KEY PROJECT IMPLEMENTATION DATES	6. ESTIMATED PROJECT FUNDING	7. PERIOD COVERED BY EVALUATION
A. First PRO-AG or Equivalent FY____ B. Final Obligation Expected FY____ C. Final Input Delivery FY____	A. Total $ 1.7M B. U.S. $ 1.7M	From (month/yr.) June 1979 To (month/yr.) July 1984 Date of Evaluation Review

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

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
1) The Projects' focus on income - generating activities across a spectrum of agricultural and agriculturally-related areas should be maintained and incorporated into appropriate technology programs of the Agricultural Mechanization Research Institute.	MOA	NA
2) A review of Project sub-activities should be undertaken to test their liklihood of success.	MOA	December 1984
3) The lessons learned from this Project should be incorporated into future appropriate technology efforts.	USAID/GOE	NA
4) Appropriate technology subprojects identified as cost-effective by this evaluation should be extended through other USAID/AGR projects, such as the Small Farmer Production Project.	AD/AGR	December 1985

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

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

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

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

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

Arnold Radi, AGR Arnold J. Radi
David Dod, DPPE
Arthur Handly, DD

12. Mission/AID/W Office Director Approval

Signature: M.P.W. Stone

Typed Name: M.P.W. Stone

Date: 8-10-84

AID 1330-15 (3-78)

NEAR EAST EVALUATION ABSTRACT

PROJECT TITLE(S) AND NUMBER(S)	MISSION/AID/W OFFICE
SMALL SCALE AGRICULTURAL ACTIVITIES (263-0096)	USAID/CAIRO

PROJECT DESCRIPTION

This project was designed to make appropriate technological modifications to existing agricultural practices and to introduce simple improved variations to on-farm methods in order to reduce labor costs and to improve yields of small farmers.

AUTHORIZATION DATE AND U.S. LOP FUNDING AMOUNT	PES NUMBER	PES DATE	PES TYPE
6/79 $1.7million	84-13	July 1984	[x] Regular [ ] Other (Specify) [ ] Special [ ] Terminal
ABSTRACT PREPARED BY, DATE: NShafik, DPPE/PAAD July 1984	ABSTRACT CLEARED BY, DATE: A. Radi, AGR July 1984		

This end-of-project evaluation was conducted by a six person team with expertise in institution-building, economics, industrial extension, animal production, plant production, and rural sociology. Progress in implementing mid-term evaluation recommendations was assessed and overall project accomplishments were reviewed. The team conducted interviews, reviewed documents, went on field trips, and presented a series of seminars designed to stimulate participant interest in continuing project activities after the PACD.

After a slow start, the Project experienced a major reorganization after the mid-term evaluation in 1981. Many of the evaluation recommendations were implemented, the technical assistance contract was terminated, and the Project focus broadened under the management of the Ministry of Agriculture to include a variety of approaches to appropriate technology.

The Project exceeded its original targets in terms of numbers of appropriate technology subprojects it sponsered. Fifty-two technologies in six different areas (food processing, rural development, pest control, animal production, plant production,and irrigation/soil preparation) were introduced. Most of the sub-projects were favorably evaluated on the basis of appropriateness, replicability, cost effectiveness, adoption, and effective use. The outputs of 31 of the subprojects have started to reach end-users in modest numbers. The Project design assumed that the small farmer and rural manufacturer, once made aware of the Projects innovations, would respond rapidly with minimal one-on-one extension. This neglect of extension by the Project and an inadequate linkage to the Ministery of Agriculture's Central Extension Service detracted from project impact. Nevertheless, the project has made commendable progress in a relatively short period of time. The project has also collaberated with various USAID and non-USAID activities in related areas (USAID's Rice Research and Training, Agricultural Mechanization, Small Farmer Production, Agricultural Development Systems Projects, Catholic Relief Services, and the Engineering and Industrial Design and Development Center). The Project has contributed to developing a nascent interest and capability in appropriate technology in Egyptian agriculture. The degree of instituitionalization will depend, to a large extent, on the level of support given to appropriate technology by the Agricultural Mechanization Research Institute.

Lessons Learned: (1) Reliance on the "demonstration effect" for spreading new technology is not sufficient. An active extension effort is necessary. (2) Establishing a "bottom up" approach to institutionalization is a time consuming process. (3) A base-line socio-economic study and socio-cultural expertise throughout the life of the activity would have contributed to evaluating Project impact. (4) A mid-term evaluation can be a useful management tool for identifying implementation problems and proposing solutions.

ISN = 36584

EVALUATION
SMALL SCALE AGRICULTURAL ACTIVITIES PROJECT

EGYPT

Prepared by:

Ronco Consulting Corporation
1629 K Street, N.W.
Suite 401
Washington, D.C. 20006

David P. Harmon, Jr., Team Leader/Institutional Specialist
Joseph K. Campbell
Industrial Extension Specialist
El-Kheir Khalafalla
Animal Production Specialist
William J. Russell
Plant Production Specialist
Wendy Wilson
Rural Sociologist

Ministry of Agriculture

Dyaa Abdou, Economist

June 30, 1984

C

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Special thanks to Dr. Dyaa Abdou, Economist from Zagazig University for his assistance in gathering and analyzing data on many of the sub-projects.

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ACRONYMS

AMP	Agricultural Mechanization Project
AMRI	Agricultural Mechanization Research Institute
AT	Appropriate Technology
CRS	Catholic Relief Services
FAO	Food and Agriculture Organization
GOE	Government of Egypt
IRRI	International Rice Research Institute
LOP	Life of Project
MOA	Ministry of Agriculture
PACD	Project Assistance Completion Date
RA	Resident Advisor
SFP	Small Farmer Production Project
SSAA	Small Scale Agricultural Activities Project
USAID	United States Agency for International Development

SSAA SUB-PROJECTS (CHEMONICS)
August 1980 - February 1982

	Name	Status
	Modification/Adaptation of Cotton Equipment	Became Sub-Project No. 28 under MOA
	Irrigation, Fertilization and Soil Management Improvements for the Small Farmer	Became Sub-Project No. 2 under MOA
	Improved Vegetable Packing Boxes	Reported as completed in early 1982, and in use in rural areas.
	Introduction/Development of Small Seed Drills and Transplanters	Became Sub-Project No. 20 under MOA
	Solar Drying of Fruits and Vegetables	No Further Work under MOA, assumed cancelled
	Testing and Development of Small Tractors	Not resubmitted to MOA for consideration
	Rural applications of Solar Electric Equipment	Cancelled - First Quarter 1982
	Development of Tool Carrier and Tillage Equipment	Not resubmitted for consideration
	Improvement of Bee-Keeping and Development of Honey Processing Equipment for Small Farmers	Became part of Sub-Project No. 8 under MOA
0	Expansion of Drip Irrigation	Became Sub-Project No. 42 under MOA
1	Development or Adaptation of Small Scale Harvesting Equipment	Became Sub-Project No. 6 under MOA
2	Rat Control Methods in Rural Areas	Reported as Completed-First Quarter 1982
3	Non-Wooden Bee-Hive Development	Became Sub-Project No. 8 under MOA
4	Revival of Raw Silk Production in Egypt	Became Sub-Project No. 7 under MOA
5	Use of Sex-Attractant Traps in Agriculture	Became Sub-Project No. 1 under MOA
6	Small-Scale Sprayer Development	Became Sub-Project No. 45 under MOA

SSAA SUB-PROJECTS (MOA)

March 1982-June 1984

No.	Name
	Using Pheremone Traps for Insect Control
	Integrated Irrigation - Machinery Management for Small Individual Holdings
	Developing A New Machine for Leveling Heavy Soils of Small Holdings
	Biogas/Organic Fertilizer Production from Wastes and Refuses
	Application of Soluble Fertilizers with Irrigation Water
	Modification of Manual and Motorized Equipment for Crop Harvesting on Small Holdings
	Revival of Raw Silk Production in Egypt
8	Manufacturing Bee Hives from Non-wooden Materials
9	Increasing The Efficiency of Border Irrigation for Small Holdings
10	Production of Seedlings for Wind Barrier Trees and Ornamental Plants within Rural communities
11	Development of Technical Skills in Rural Areas (Rural Workshops)
12	Improvement of Local Traditional Irrigation Water Lifting Devices
13	Production of Medicinal Herbs and Distillation of Aromatic Oils
14	Water Supply and Sanitation Units for Rural Houses
15	Developing A Small-Scale Incubator and Hatchery for Poultry Production
16	Improvement of Egyptian Feta (white) Cheese at the Rural Household Level
17	Sprinkler Irrigation Device for Small Holdings
18	Production of Suitable Agricultural Guidance Information (Booklets, Leaflets)
19	Local Preparation of Renneting Enzyme from the Rumen of Mature Cattle
20	Developing A Small-Scale Seed Drill for Small Holdings
21	Developing A Multipurpose Manual Transporting Cost for Rural Areas
22	Utilization of Plastic Sheets and Green Houses for Vegetable Production on A Small-Scale
23	Using An Artificial Media Made of Farm Refuses as A Substitute for Peat Moss
24	Winnowing and Sieving Unit to be Attached to Threshing Machines
25	A Diaphragm Type Pump
26	Using Organic Farm Refuses as A Feedstuff for Farm Animals
27	Growing Algae as A Feedstuff for Poultry and Fish
28	Testing the Efficiency of A Manual Cotton Planter
29	Design and Application of A New Generation of Direct Contact Weed Sprayers
30	Development of Food Industries for Small Farmers in the Fayoum Governorate

No.	Name
31	Food Processing in Rural Areas
32	A Simple Butter Churn
33	Developing Some Conventional Services for Banana Farms
34	Castor Silkworm Production and Silk spinning/weaving in the Domyetta Governorate
35	A Manual Flame Blower for Weed Control
36	Local Production of Yellow Carrot Seed
37	Improvement of White Cheese Quality
38	Production of Better Quality Milk
39	Raising Rabbits in Boxes
40	Foliar Fertilizer Application for Vegetable Production
41	Intensive Cropping Techniques for Increasing Land Productivity
42	Manufacture and Application of Drip Irrigation Units for Small Holdings of Fruit and Vegetable Production
43	Forming Conical Soil Shapes for Intensive Vegetable Production
44	Production of Onion Seedlings and Onion Bulbs Using Manual Planters
45	Self-Powered Insecticide Sprayer
46	Development of Small-Scale Food Industries in Rural Areas
47	Development of Tools and Devices for Collecting Fruits and Vegetables
48	Developing A New Machine for Fine Leveling
49	Simple Multipurpose Agricultural Structures

No.	Name
50	Development of Rural Women's Activities and Standard of Living
51	Development of Small Farmer Activities and Standard of Living in the North Sinai Governorate
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I. EXECUTIVE SUMMARY

This final evaluation of the Small Scale Agricultural Activities Project (SSAA) comes five years after the Project Paper was approved. An ambitious effort, with an integrated focus, this was the first USAID project in Egypt designed specifically to research, develop, test and extend appropriate technology to the small farmer and other segments of the rural population. Of the 50 sub-projects currently operative, the outputs of 31 are starting to reach the end-user, some in significant quantities.

This project basically had two phases. The first phase, involving the contractor, Chemonics, was a start-up and initial implementation phase with developmental work done on 16 sub-projects, but with little extension to the end-user. The second phase, under the aegis of the Ministry of Agriculture, entailed a focus expanded from principally the development of equipment to meet small farmer needs to a broader spectrum of activities including not only equipment, but also plant and animal production, pest control, and income generating activities for different groups of rural people.

The project suffered from a time frame, which in the opinion of the evaluation team, was too short to accomplish all that was expected of it. The principal deficiency in the design of the project was the assumption that the small farmer and the small, rural manufacturer, once made aware of the innovations coming out of the SSAA Project, would respond by rapidly adopting them, with minimal one-on-one extension work necessary. Thus no funds were budgeted for in-country training of project and

project related personnel in direct extension to end-users.[1] Also, the mandate of the Ministry of Agriculture's Central Extension Service did not include the automatic extension of the output of the SSAA project.

Nevertheless, the progress that has been made in a relatively short period of time is very commendable. An institutional base and capability has been established. Most of the sub-projects' activities were found to be appropriate, replicable at a reasonable cost, and cost effective compared with traditional activities for the end-user. In some cases, the outputs were too expensive for the individual small farmer, but were within reason for a small group of neighboring farmers. Many of the income-generating activities, principally in the food processing and dairy areas, had positive effects for rural women.

The activities of this project are to become part of the newly established Agricultural Mechanization Research Institute (AMRI) for a period of one to two years while the reorganization of the Central Extension Service is completed. Once the reorganization is finished, the Central Extension Service will be responsible for extending appropriate technology, while the various research institutes which make up much of the overall research activity in Egypt will each have responsibility for the development of appropriate technology in their respective areas.

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[1]On May 22, 1983, the Project Grant Agreement was amended to reflect the reallocation of approximately $76,000 for this purpose. By this time, however, the project only had 13 months before its PACD.

The major recommendations which the team offered center about the placement of appropriate technology activities in the Agricultural Mechanization Research Institute. Specifically, AMRI's organizational structure and institutional direction should be made flexible enough to accommodate both mechanical and non-mechanical aspects of appropriate technology. Furthermore, it should give the appropriate technology activity sufficient autonomy to maintain the high level of creativity and the breadth of response which characterized the work of the SSAA project and its personnel.

Finally, the focus of appropriate technology activities should be expanded to include activities along the "food-chain" - from the consumer back to the farmer. This recommendation is made in order to capitalize on opportunities which exist in the food chain, and to relieve constraints in the distribution/ marketing segment of the chain which prevent the farmer from growing more high value crops because the crops do not move to markets as efficiently as they should, and which cause the consumer to pay higher prices than he should.

Detailed progress, findings and recommendations are found in Sections V-XII. The final section treats the questions of what was learned from this project which will be useful for USAID in the future, as well as recommendations for the future of appropriate technology activity under AMRI.

II. PROJECT BACKGROUND

A. Brief Description

The Small Scale Agricultural Activities Project was the first USAID project in Egypt designed specifically for the tasks of researching, developing, testing and extending appropriate agricultural and agriculture-related technology to the small farmer and to other segments of the rural population. In addition to the development and extension of AT (prototype solutions), the project's components included:

1. An informational component comprised of an on-going review of AT in Egypt, communication and information exchange with other world centers for AT, the establishment of an AT library and data bank, and close collaboration with USAID and other donors in the sharing of AT ideas and information.

2. A training segment comprised of on-the-job training for counterpart and cooperating agency personnel working on the project, and participant training overseas in various countries where AT efforts were on-going and relevant to Egypt's needs.

3. The development of sub-projects using a model shop to carry out research and development of prototypes to be turned over to small rural workshops for wide-scale production.

4. An extension segment whereunder the tested and final-approved prototypes would then be extended to farmers

and local manufacturers/entrepreneurs via both demonstrations and on-site instruction of users. In addition, appropriate instructional materials would be prepared.

5. An institutional evaluation component aimed at determining the demand for and prospects of a permanent Egyptian AT institution.

This project began on June 30, 1979 with the signing of the Project Grant Agreement and was to have been completed by June 30, 1982. Since this date, there have been two one-year extensions of the PACD - to June 30, 1984. At the end of this section a time-line of project activities is presented.

B. Rationale

The project has as its overall goal "... an improved quality of life for rural families and the increased participation by small entrepreneurs in national economic development."[1] From the standpoint of USAID objectives and strategies, the project fit into the strategy of agricultural sector growth with employment, and the objectives of increased indigenous private sector involvement, of overcoming inefficient agricultural production practices and alleviating certain post-farmgate problems. It was thus seen both as filling a void in USAID's agricultural assistance program and as a means of enhancing USAID's overall

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[1]Project Paper, Small Scale Agricultural Activities: 236-0096, USAID/CAIRO, April 1979, p.4.

agricultural assistance.

The aims of the project were also consistent with Egyptian goals of economic growth, attention to integrating the rural poor into the economic and social mainstream of the country, and to raise their standard of living. The project was consistent with the continuing need to increase agricultural output to meet growing population demands, to provide more employment, and to create more export earnings.

C. Project History

1. Development of the Project: Project design was carried out over the period late 1978 - early 1979 by personnel of USAID/CAIRO and the Ministry of Agriculture. It was to have been a three-year long, somewhat experimental, first step in the development and institutionalization of Egyptian ability to research, develop and extend AT. From the outset, the project depended on modest financial resources and limited personnel, in retrospect a limited time-frame, and perhaps most important for its success, the ability to engender interest in other organizations to support and spread AT widely over Egypt.

Specifically, the project was to develop its own mechanical, process, and technological innovations as well as adapt appropriate equipment, process and technologies successful in other countries. Innovations from both sources (developed locally and foreign-adapted) had to meet the criteria of:

- o addressing the current needs of small farmers.
- o compatibility with local social conditions.

o using existing resources in optimal ways.[2]

Key to and a condition of broad dissemination of an innovation was that beneficiary needs be met not only through the research and development of an innovation, but also through its further development and refinement both in rural workshops and on the farm. Only in this way could beneficiary acceptance be determined and therefrom the potential success of the innovation.

The total cost of the project was $2.1 million of which $400,000 was the approximate contribution of the Egyptian government. The Egyptian contribution was the provision of manpower and facilities spread over the technology development, training, extension and instructional materials components of this project.

2. Implementation: The project paper called for three phases, namely: a three to six month start-up phase, a 24-27 month implementation phase, followed by a final six-month period during which implementation would continue and a follow-on project aimed at institutionalization of AT activities would be designed. The implementation of the project actually covered five years, made up of an initial, planned for, three years, followed by two one-year extensions.

The project history was somewhat different than that planned. It breaks out into two broad phases, the first under the aegis of Chemonics International Consulting division, the contractor selected to provide long term technical assistance, and the

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[2]Chemonics International Consulting Division, "Final Report for the Small Scale Agricultural Activities Project," p. 4.

second under the aegis of the Ministry of Agriculture.

a. Chemonics: The total period of Chemonics' activity on the project extended from August 1980, when the MOA and Chemonics signed the contract for Chemonics to provide technical assistance, to August 1982 when Chemonics' Resident Advisor submitted his final report coincident with his departure from Cairo. At that time, Chemonics proposed that the contract be extended until June 1983; however, they and the MOA were unable to agree on the need to extend the contract. The MOA took charge of project activities shortly thereafter.

Chemonics' period of work actually breaks out into two sub-phases, principally due to a change in MOA project management and a resultant shift in direction of project activities.

(i) Sub-phase I: September 1980 - January 1982

This first period encompassed the usual administrative and logistical start-up activities of a project, as well as laying the ground work for application of AT in Egypt and the sequenced development of AT solutions for subsequent extension to rural peoples' needs. During this sub-phase, the 16 sub-projects undertaken largely entailed the development or adaptation of mechanical equipment aimed at small farmer needs. These sub-projects and the sub-projects under MOA's management were selected by the project Appropriate Technology Task Force from applications made from various cooperating organizations, e.g., universities. After review and selection, the project iteself then funded the chosen sub-projects. Unlike other USAID projects

in Egypt, SSAA did not have a University Grant component. In fact, when the Chemonics RA arrived in Cairo, ten of the sub-projects had already been reviewed, approved, and were under development. By the end of sub-phase I, two sub-projects were deemed to have been completed, ten sub-projects were transferred with or without modification into the group of sub-projects undertaken in sub-phase II, and the remaining were cancelled.

During sub-phase I, the initial informational and offshore and participant training components proceeded fairly adequately, but little extension to the end-user was carried out. With the lack of extension activity and concomitant feedback, the institutional evaluation component suffered. In October 1981, a mid-course evaluation was carried out.

(ii) Sub-phase II: February 1982 - August 1982

Sub-phase II was marked by a change in MOA's SSAA project management staff, a three-month suspension and review of prior sub-project activities, and a return to the original purpose of the project accompanied by an expanded focus. While sub-phase I concentrated largely on the development of equipment to meet small farmer needs, sub-phase II shifted its focus to plant and animal production as well as machinery development, and on another plane, to income generating sub-project activities targeted not only to farmers and small manufacturers, but also to other rural people including village women. A broader spectrum of rural needs and rural beneficiaries was sought in order to accelerate accomplishment of project objectives.

The sub-project solicitation and review which took place during the period February-June 1982, resulted in the approval of 46 sub-projects, the initiation of development work for the new sub-projects, and continuation of work on those transferred from sub-phase I. Little progress was made on the informational, training, extension and institutional evaluation components during this sub-phase.

Chemonics, during its tenure on the project, carried out the following work as required by its contract:

- Assistance on the management and logistics component of the projects. Helped refine the Appropriate Technology Task Force and the Technical Committee.
- Carried out a review of AT in Egypt, informtion exchange with foreign AT institutions, established a library on AT and started laying the ground work for a permanent AT institution in Egypt.
- Established a model shop for the project and started on-the-job training for SSAA personnel. Carried out off-shore participant training.
- Met its reporting requirements.
- Provided 1.5 work months of home office project supervision as was anticipated at the initiation of the contact.

Chemonics only provided 3.5 work months of short term technical assistance of the 18 months foreseen, and most of this under the early phase of its tenure in Egypt. Chemonics provided 24 months of long term technical assistance as it had contracted to do.

The technical assistance which did not take place was that to have been provided by an agricultural and an industrial extension specialist. This technical assistance did not come about, in part because the development had not progressed to the stage where the industrial extension specialist was required, and in part as Chemonics stated on page 18 of its final report:

> "...technical assistance was rendered under the host country contracting mode, and thus the level of technical assistance is ultimately the decision of the host country client."

Chemonics wanted to extend the contract for one year to complete work including the short term assistance which had been rendered, but the MOA felt that there was sufficient technical expertise within Egypt to meet the technical objectives of the project.

The evaluation team feels that the contractor on balance gave its best efforts, but it was unfortunate that there was not more output. The shortness of time had a great deal to do with the amount of output. The reorganization which took place at the beginning of the last half year of the project delayed Chemonics' progress to a degree because of the time to carry it out and the need for reappraisal of sub-projects, solicitation of new ones and their review for approval. Over the last five months of the Chemonics contract, the RA, for various reasons, became less involved with the project.

Finally, case studies of successful sub-projects were called for in the Contractor Workplan (January 15, 1981) as stated on page 2:

> "...case studies have been indicated for several sub-projects but, in fact, will only be conducted on those sub-projects

which result in successful introduction of a new or refined technology."

Since no sub-projects had yet resulted in a <u>successful introduction</u> (which presumably implies enough accepting end users to make a case study complete and meaningful), there were no case studies done.

b. <u>Ministry of Agriculture: September 1982 - June 1984</u>

The SSAA project, after the rapid growth in number of sub-projects approved during the second quarter of 1982, added eight new activities, while cancelling four, thus bringing the number of sub-project activities to 50 in various stages of development/extension/completion today. The entire sub-project activity development is portrayed in Appendix 6, SSAA Sub-Projects (MOA).

As stated by the project coordinator (May 15, 1984) the SSAA project in this phase had four principal stages, viz:

1. adaptation of technology to local needs and conditions.
2. limited application of developed solutions.
3. wider application of developed solutions.
4. withdrawal of sub-project teams from villages; observation of progress continues; if necessary, team returns to village.

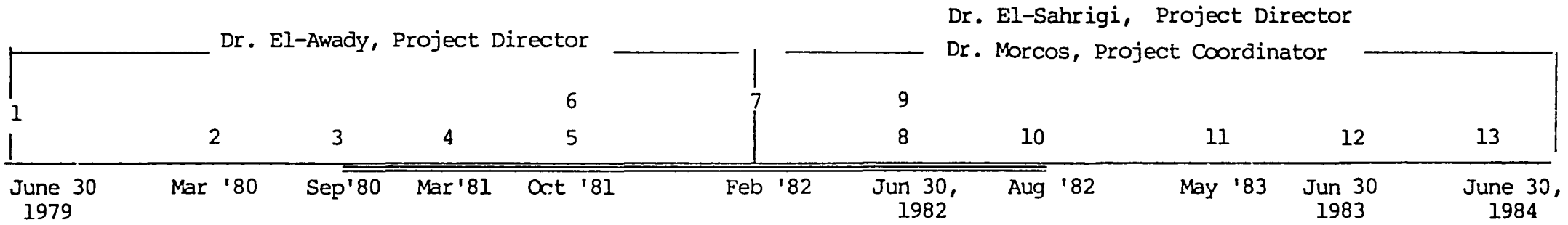
The last sub-project (#54 - introducing different technological methods for rice crop production) was started in January 1983. The first six months of this last phase gave many researchers, masters' and doctoral candidates the opportunity to apply their

ideas. The final nine months can be best described as a time of finalizing the "work in process" and withdrawal of field work from the sub-project areas without the expenditure of additional funds.

In February 1983, a three month extension from July 1, 1983 to September 30, 1983 was requested of USAID. After discussion, USAID decided to extend the PACD until June 30, 1984 to allow the MOA enough time to use the remaining authorized funds to bring as many of the higher potential sub-projects as possible closer to fruition. On the MOA side, an "open" budgetary process was established whereunder a sub-project principal investigator could request additional funding for his sub-project. If the SSAA project Technical Committee found that the sub-project did in fact have high potential, it could authorize up to LE 1000 and more if the extent of the sub-project work justified the additional financing.

Today, the SSAA project is nearing its PACD. Many of the sub-projects have progressed from the prototype development stage to the early stages of extension. The SSAA project is slated to become a part the newly established Agricultural Mechanization Research Institute (AMRI) under the aegis of the Ministry of Agriculture. Recommendations regarding AT activities under the AMRI are discussed in Section XIII, Lessons Learned.

SMALL SCALE AGRICULTURAL ACTIVITIES PROJECT
TIME LINE



1. Project Grant Agreement executed.
2. SSAA project activities start; Dr. Nabil El-Awady installed as project director.
3. Chemonics' Resident Advisor arrives.
4. J. Ross three week consultancy re vegetable packing boxes.
5. F. Hopman one month consultancy re solar drying and L. Skromme two week consultancy re small scale harvesting equipment.
6. R. Pearson evaluation - served as mid-course evaluation.
7. Change in administration of project in MOA and change in focus of project.
8. Original PACD; project extended to June 30, 1983.
9. Decree No. (3) forming follow-up work teams for sub-projects.
10. Chemonics RA departs with end of Chemonics contract
11. May 17, 1983 - PACD extended until June 30, 1984
12. SSAA Project Annual Report for fiscal year 1982/83.
13. Ronco team arrives for final evaluation.

A. Reason for the Evaluation

The reason for this evaluation is to assess the progress which the Small Scale Agricultural Activities (SSAA) Project (No 263-0096) has made over the life of the project (LOP), to assess the impact it has had on target beneficiaries, and to identify sub-project activities that are worthy of future replication as well as those activities which are inappropriate and therefore to be avoided in the future. This is a final evaluation.

B. Composition of Evaluation Team

David P. Harmon, Jr., Team
  Leader/Institutional Specialist
Dyaa Abdou, Economist
Joseph K. Campbell
  Industrial Extension Specialist
El-Kheir Khalafalla
  Animal Production Specialist
William J. Russell
  Plant Production Specialist
Wendy Wilson
  Rural Sociologist

C. Planning and Orientation

Shortly after arrival in Cairo, four of the team members attended a two day conference hosted by the Small Scale Agricultural Activities Project. This conference served to introduce the team members to the activities of the project and to key individuals

in the project. The following Monday (May 15, 1984) the entire evaluation team met with the USAID Project Officer to review the required scope of work, obtain documents, and to receive a briefing on the status of the project.

The team then met with the project coordinator and the extension advisor from the Ministry of Agriculture to develop a work/evaluation schedule, to plan field trips, to discuss and settle on individual topics for seminars to be given, and to decide on topical areas and a schedule for a series of five workshops. A second meeting was held with the project coordinator to refine the work/evaluation schedule and to gain further insight into project activities.

The team leader, prior to his departure from Washington, met with the Project Supervisor from Chemonics International Consulting Division to review orientation and background on the project's history.

D. Data Collection

Five methods of data collection were used:

- Examination of documents.
- Attendance at a two-day conference at which the various sub-projects were discussed and at which prototype equipment was on display.
- Personal interviews of project personnel, personnel from other projects organizations with which the SSAA has linkages, and project beneficiaries

(farmers, villagers (men and women), small entrepreneurs/manufacturers).

- Participation in workshops in which team findings were discussed in order to refine them, and to gain information on those sub-projects the team was unable to visit. Certain sub-projects were not seen due to the team's relatively short time in country and the large number of sub-project activities dispersed over the country.
- Direct observation of project activities.

Project documents were supplied by the Mission Project Officer and by the Ministry of Agriculture's Small Scale Agricultural Activities Office throughout the work period. Although the statement of work did not include MOA participation on the evaluation team, a member of the Ministry worked with the evaluation team on data collection and analysis.

Semi-formal interviews were held with key project individuals in each principal area of activity. The interviews were structured to the extent that they gave the team members additional background, current status of sub-project activities, as well as the interviewee's perceptions/opinions and recommendations for the future of sub-project activities were sought.

All interviewees were assured that all information received would be treated objectively in the evaluation. Furthermore, they were reminded that the evaluation was of a constructive, not an antagonistic, nature.

Informal interviewing also took place throughout the entire

direct observation (field trips) portion of the evaluation.[1] Sub-project personnel accompanied team members to each village/city and/or sub-project activity, thus permitting additional information, impressions, and insights to be gained. They were also available for discussion in Cairo at the workshops, seminars and by appointment.

The participation in the five workshops permitted additional interviewing, verification of data gathered in the field, and the forming of tentative conclusions and recommendations.

The two-day conference was scheduled at the beginning of the evaluation and served to introduce the team members to many of the sub-projects, their outputs, to Ministry of Agriculture personnel and to sub-project principal investigators.

The team, divided according to specialities, initially spent ten days in the field inspecting sub-project activities across the spectrum of areas in which the project operates, viz: plant production, animal production, rural development, food industry, pest control and irrigation, fertilization and soil preparation.

The team inspected workshops at various universities and at the Ministry of Agriculture where equipment processes were and are being developed and tested. The team evaluated the progress made in extending the equipment/processes developed to rural workshops, small entrepreneurs, and to ultimate recipients, the end-users. The field trips included five one-day visits to areas in the Nile Delta, El-Giza and El-Fayoum, a two-day

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[1]See Appendix V for questionnaire employed on the field trips.

trip to Ismailia and the North Sinai (El-Arish) and a two-day trip to El Minya. Because the project activities are widely spread over Egypt, it was decided to see representative sub-projects that are clustered geographically in order to optimize the limited field time the team had.

During the latter half of the evaluation, team members presented a series of seminars on a cross-section of topics of high relevance to the project, its participants and beneficiaries. The seminars offered an opportunity to provide new perspectives on the overall project and on many sub-project activities, and were designed to stimulate participant interest in continuing project activities after the PACD.

In addition, the team leader and one team member spent time prior to departure from the U.S. obtaining bibliographies of appropriate technology publications and a micro-fiche library from which the SSAA or its successor may wish to select publications for future purchase.

E. Synthesis and Write-Up

Data, impressions, tentative conclusions, and potential recommendations were discussed within the Ronco Team to achieve a consensus and to increase the reliability of team evaluations. The evaluation responds to the statement of work (Appendix 2) within the framework of the revised format of the Project Evaluation Summary Part II accepted by the Near East Bureau, as will be seen in the following sections.

Each team member took primary responsibility for drafting

responses to the scope of work according to his/her speciality and the field work he/she carried out. Each team member reviewed and commented on the work of the others. The individual responses provided the basis for the overall evaluation report.

During the last ten days of the work period, the team submitted a draft final report to the Ministry of Agriculture and USAID for their comments. Prior to departure the evaluation team met with the Ministry of Agriculture's SSAA Project Director and Coordinator to review its findings, conclusions and recommendations. The team met with USAID for the same purpose. A final report was left with the Mission and the Ministry of Agriculture by the team leader. Ten additional copies of the report were duplicated and bound in Washington, D.C. and shipped to the Mission prior to June 30, 1984.

F. Constraints

The evaluation team faced certain constraints which limited the field work it was able to do. Because the numerous sub-projects which comprise the SSAA project are scattered geographically, and because of the number of workshops and seminars required to be given by the team members, the team was not able to visit all the sub-projects. Additionally, the time allowed for field work was limited by the unavailability of some sub-project principal investigators due to final examinations at the universities during the end of May, the start of Ramadan on June 1, and the general difficulty in communicating rapidly with other parts of Egypt from Cairo. Finally the lack of complete, up-to-date

information on the current status of many sub-projects limited the amount of quantitative analysis the team could do.

Following is a calendar of the evaluation team's activities:

May 10	Arrival in Country.
May 12-13	Two-day conference.
May 14-15	Briefing, Orientation and Workplan preparation.
May 17-27	Field Trips.
May 28-31	Workshops, additional data gathering and synthesis.
June 3-13	Seminars, data synthesis and report writing.
June 14	Draft final report to Ministry of Agriculture and USAID.
June 17	Meeting with Ministry of Agriculture to review findings, conclusions and recommendations.
June 18	Meeting with USAID to review findings, conclusions and recommendations.
June 18-19	Team's response to comments.
June 20	Departure of Team specialists.
June 20-23	Report finalized for delivery to USAID and Ministry of Agriculture.
June 26-30	Printing, binding and shipment of 10 copies of final report to Mission.

IV. EXTERNAL FACTORS

This section describes various external factors which affected the project. While the evaluation team did not have sufficient time to make detailed analyses, nor was its function to do so, nonetheless, it feels that these external factors are important and should be brought to people's attention.

A. Policy

1. Large Scale Solutions. There is a general emphasis on large-scale, relatively high-technology solutions to Egypt's large-scale, pressing agricultural/food/balance of payments problems. Appropriate technology thus tends to take a back seat in the planning for and implementation of current and future development. This is unfortunate because small scale activities do not automatically preclude high technology. Furthermore, high technology does not have to be costly, large-scale, nor entail intensive training. The use of pheremone traps (sub-project No 1) is small-scale, inexpensive, involves limited training, but in concept can be considered high technology - as a biological element of integrated pest control. Biological controls are on the leading edge of agriculture.

In spite of the fact that technological advances, often sophisticated, are being made in Egypt, the advances and sophistication are not available nor applicable to many smaller farmers. Because their needs are not covered, an entire range (in sophistication and cost) of AT solutions is applicable.

2. Price and Cropping Pattern Policies. The Egyptian government maintains fixed producer prices for the major food and export crops except maize, berseem, barley, sorghum, flaxseed, vegetables, fruit, meat and poultry, and attempts to enforce certain cropping patterns. Also, some key input prices are fixed. Thus, certain product and input prices are fixed and others are determined by market forces. The result can be distortions and misallocation of resources.

As an example of the distortion of price policies, cotton procurement prices at the farmgate make cotton relatively unprofitable to grow, and in spite of acreage controls, cotton acreage is shifting into long season berseem reflecting the relative profitability of red meat domestically. Demand for berseem coupled with demand for wheat for straw (bulk in animal rations) and the price/acreage controls "... pits man (wheat) against animals (fodder) against the government (cotton).[1] Price policies also can determine the profitability of using/buying equipment. For example, the manual seeder developed under sub-phase I of SSAA was not profitable to the farmer to use to plant wheat (it was cheaper to use labor); however, for use in planting lentils, the farmer realized a savings of up to 70 LE/feddan in terms of labor and proper seeding rates.

The GOE is very concerned with the fact that domestic consumption of food exceeds domestic supplies, and thus is requiring increasing imports of food commodities. It is aware of the

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[1]"Strategies for Accelerating Agricultural Development," A Report of the Presidential Mission on Agricultural Development in Egypt, Annex B, p. 5.

counterproductive effects of its agricultural price policies, and is starting to address these problems.

3. Subsidized Prices of Petroleum Products. This factor has adversely affected the development of sub-project No. 4, Biogas Production. The low prices of petroleum products tend to make this sub-project financially unfeasible for the small farmer.[2]

4. Saving and Investment. Farmers have not been encouraged to save and invest. Thus, where certain AT equipment could increase their income, they often do not have enough money to buy the equipment. This affects the type of AT developed by SSAA, i.e., it must be affordable by the small farmer.

On the other hand, this does not mean that all small farmers do not have financial access to even some of the more expensive AT. The experience of the SFP project has shown that with cropping restrictions lifted for participating farmers and feasibility studies used to help guarantee a loan, these farmers, without collateral, can tap into the credit system.

B. Economic

1. Irrigation Water. The presence of the traditional system of "free" irrigation water in the Nile valley affects

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[2]However, in Tahrir province, seven farmers have spent their own funds (800-900 LE each) to build biogas units for better utilization of manure and to ensure year round availability of gas. The alternative, propane, while low in price, is not always available in some areas of Egypt - thus the interest in biogas units, in spite of the relatively high investment required. A single large cash outlay is more economic for farmers in some cases than the risk involved with periodic lack of availability of other energy sources.

the economic incentive perceived by the farmer to use certain of the water related project innovations.

2. Rural Work Shops. Work shops and repair shops, where they exist in villages, and those in market towns, tend to be poorly equipped, and lack spare parts. Furthermore, the small manufacturer needs credit to be able to tool up to manufacture the equipment generated from the SSAA project, and some demand "pump-priming" in the sense of an initial guaranteed market (see later discussion re "other channels" and commentary on the Small Farmer Production Project).

3. Maintenance. Farmers tend not to have a good understanding of proper, timely preventive maintenance for machinery and equipment. This has design and extension implications.

4. Competition. The existence of competition at the commercial level is a factor to be taken into account. For example, the sub-project Nos. 16 and 37 supplied a farmer in El-Arish with the necessary equipment to produce cheese and yogurt. This farmer subsequently found himself in competition with a commercial producer of the same products and could not meet his prices. The farmer subsequently dropped the activity.

5. Labor Availability. Emigration of labor to Saudi Arabia and the Gulf States coupled with a relatively inexpensive, widespread public transportation system in Egypt (ease of movement to cities) affects the availability of agricultural labor. This labor mobility and growing lack of availability forces the development and promotion of labor-saving and/or capital intensive AT.

6. Cash Credit. Small farmers, women engaged in income-producing enterprises, and rural workshops have limited access to cash credit.

7. Marketing Infrastructure. Indirectly the weak Egyptian distribution infrastructure adversely affects the vegetable and fruit production related activities of SSAA. Poor handling practices and the fragmented nature of the marketing infrastructure means that perishables are in a poor state by the time they reach the consumer. Lack of on-farm storage and a shortage of refrigerated storage in Egypt are factors which limit production of fruits and vegetables that will keep.

C. Social

1. Extension. In general, extension in Egypt is viewed as a "top-down" exercise. Farmers' problems are "identified" in Research Centers and in universities, solutions are developed with little or no farmer input on either the problem or the solution, and the "solution" is presented to the farmer. Furthermore extension work in Egypt suffers from the same maladies it does in much of the developing world. These maladies are set forth in the July 1982 report of the Presidential Mission:

> The current Extension Service is suffering from an inadequate concept of mission, conflicting assignments, very low status and compensation, many poorly trained people, and a general lack funds for training, equipment and transportation.[3]"

Furthermore, there is the usual weak farmer-extension-research

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[3]Ministry of Agriculture of the ARE and USAID, "Strategies for Accelerating Agricultural Development: A Report of the Presidential Mission on Agricultural Development in Egypt," Cairo, July 1982, p. 128.

linkage which hampers the required two-way flow of information. The nature of the Egyptian extension service and how extension is believed to work in general impedes the entire AT process from identifying problems to arriving at viable solutions.

The GOE has recognized the shortcomings of its extension service, and has set out to improve the situation. It has placed the extension system on a par (in importance) with agricultural production. It is aware, from the results of major USAID funded projects that with support and incentive given to the extension worker, he will work and he is effective.

2. Labor Mobility. The movement of people from rural to urban areas caused by more and better job opportunities in the cities, a relatively good transportation system which enhances labor mobility, growing numbers of rural young attending school, makes labor-saving equipment/processes attractive, especially during periods of high demand for agricultural labor.

3. Health. The prevalence of bilharzia (schistosomiasis) among rural people adds to the attractiveness of labor saving equipment/process - especially that equipment or method which relieves the farmer of having to use his legs/feet because of the pain associated with bilharzia.

4. Small Land Holdings. The fragmentation of land holdings, the small size of many holdings and the seven-meter furrow practice limits SSAA potential in long furrow agriculture related activities and in the adaptation of motorized equipment.

D. Technological

1. Dependence on More Sophisticated Equipment. In certain cases, an appropriate technology "solution" may depend on the use of more sophisticated equipment. For example, the land leveller designed under the SSAA project depends on tractor power for its use. Many of the tractors in Egypt are from the Eastern Bloc and are designed principally for plowing and other agricultural operations for which the tractors have a single-acting hydraulic system. Most land-levellers however require a double-acting hydraulic system, which the tractors of Eastern Bloc manufacture tend not to have. Thus, the owner/operator of tractor services can not perform adequate levelling operations with the leveller. The SSAA leveller, however, was designed to circumvent this limitation.

2. Exposure to Technologies. During the occupation of the North Sinai by the Israelis, contact between them and resident Egyptian farmers resulted in the exposure to and resultant adoption of certain AT equipment/processes, namely:

- drip irrigation
- improved goat breeding
- solar water heaters

The Egyptian farmers capitalized on technologies they observed and felt were adaptable to the area.

E. Resources

The fact that not much opportunity exists for bringing additional land into production or expanding existing livestock

operations (horizontal expansion) means that for the near term, Egypt basically has to work with what it has (vertical expansion), e.g., increase yields on existing land. This fact conditions the direction of AT and the SSAA project. Examples are sub-projects dealing with long furrow irrigation, plastic green houses, upgrading the productivity of existing livestock, the alternative of feedstuffs from farm refuse, foliar fertilization, etc.

F. Developmental

Increasing population, urbanization and incomes have increased effective demand for food in general, and for certain foods in particular. With increased incomes there is a shift in dietary preferences - away from the coarse food grains to the more preferred wheat and rice, and toward red meat, fruits and vegetables. This factor, indirectly has conditioned SSAA and will continue to affect the direction of AT.

G. Other Channels For Appropriate Technology

To date, SSAA represents the principal channel for AT, however there are other conduits.

1. Catholic Relief Services

This organization has developed a 10 H.P. "multi-cropper"[4] which as a thresher/winnower can process 12 different crops. 200 machines are reported to be in the field. This

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[4]"Small and Beautiful: Appropriate Technology at Work," Cairo Today, May 1984, pp. 54-59.

level of AT is somewhat more advanced than that envisaged by the SSAA project.

CRS collaborates with the SSAA project in the revival of silk production. The SSAA sub-project No. 7 entails the extension of silk worm rearing, cocoon production and thread reeling. CRS works with SSAA on these phases; however, it has its own activity whereunder the weaving of thread and the ultimate sale of the fabric take place.

2. Agricultural Mechanization Project (USAID/MOA)

The area in which there is the most substantive overlap between SSAA and the AMP project is in long furrow irrigation. Both projects are engaged in the promotion of this activity. In this connection and as part of its land improvement program, the AMP project has ordered several SSAA levellers in the past. The AMP project, because of its credit facilities with major banks can help small rural manufacturers add to and upgrade their tools and equipment, i.e., permit the manufacturer to "tool-up" for production of SSAA generated equipment - a facet (credit) which is absent in the SSAA project. As an example of the linkages between the SSAA and AMP projects, the self-powered field sprayer developed under SSAA was adopted by AMP for further development and for local manufacture (The Behira Company).

3. Small Farmer Production Project (USAID/MOA)

This project is an important outside vehicle for AT developed in the SSAA project. The SFP project, according to its director, takes "results" from SSAA which can be applied

and which make economic sense for the farmer. The SSAA innovation usually becomes part of a SFP package offered to the farmer. For example, the small manual seeder developed under the initial phase of the SSAA project is part of a seedbed to harvesting package offered. In certain cases, the SSAA developed equipment has been used for purposes additional to that for which it was developed, e.g., the fertilizer applicators of sub-project No. 5 have been used to apply herbicides. Following is a list of the principal items and processes developed by the SSAA project and which have been adopted by the SFP project:

a. land leveller and finisher

b. seed drill

c. siphon tubes-irrigation

d. sprinkler irrigation

e. fertilizer applicators

f. banana farming package

g. foliar fertilizer package

The SFP project is able to offer small manufacturers credit, contracts to make up to 20 units of an equipment item as a means of "priming the demand pump," and actively makes the linkage between the farmer and the rural workshop.

SFP makes this linkage by (a) informing the farmer that the workshop is producing, can maintain the equipment and has spare parts, and (b) by ensuring through the credit mechanism that the workshops in fact do have spares and are capable of performing maintenance. Because SFP can do the above, it is able to extend the output of SSAA to the manufacturer. At present,

the SSAA developed sprinkler irrigation system is being manufactured in Assiut, and the banana shoot trimmer (part of the banana farming package, sub-project No. 33) is manufactured in Kalubiya and Sharkiya governorates.

Reportedly, extension has been particularly effective for the banana package as it is employed on some 1000 feddans in Assiut and 300 feddans in Kalubiya, and farmer requests for the trimmer number approximately 1000.

SFP, on its own, offers management/technical packages appropriate to the needs of the small farmer - which qualifies it as a channel for AT. An example of an SFP AT offering is a battery of 96 laying hens, racks, and a two month supply of feed concentrate on credit - as a starter diversification activity for the small farmer.

The ways in which these two projects and CRS have become linked to the AT of the SSAA project has implications for MOA. The implications are principally organizational, and entail how best to structure the new home of AT so that it can capitalize on what other projects/organizations have to offer that is additive to the success of SSAA, and in turn what the successor can offer to other projects/organizations. It will involve close contact and coordination between departments or MOA and projects under MOA which are linked to appropriate technology activity. This matter is addressed in greater detail in Section XIII, Lessons Learned.

V. KEY PROJECT ASSUMPTIONS

This section examines the major assumptions (as stated in the Project Paper) underlying the project goal, its purposes and the outputs to be achieved. It attempts to assess whether or not these assumptions continue to be valid.

A. Project Goal

The goal of the Small Scale Agricultural Activities (SSAA) was an improved quality of life for rural families and the increased participation by small entrepreneurs in national economic development.

1. Assumptions

The Project Paper and logical framework stated two main assumptions underlying the project goal, viz:

a. Increases in agricultural production or the introduction of mechanisms that will improve rural living and working conditions will better the quality of life.

b. Inflation and price policies encourage farmers to produce more and this higher production raises their income.

2. Continuing Validity of the Assumptions

Assumption (a) is still valid. Assumption (b) however is open to certain questions. First, with respect to inflation, the assumption is largely correct, however wages (per Skromme, "Harvesting Equipment Development Sub Project" p. 8, between 1978 and 1981, wages at harvest time rose five-fold) and free market prices of inputs could increase to the point where it is no longer profitable to increase production for farm products whose farmgate prices are controlled. See following comments on price policies.

Second, the assumption that Egyptian price policies encourage farmers to produce more is not always valid. In fact, farmers are switching from those crops which have low government-set farmgate prices to crops which are not price-controlled. The price control system is one which makes wheat straw (feed) more valuable than wheat (food). Increased livestock feeding and increase in herd size exceeded domestic concentrate feed supplies thus requiring imports and the use of farm products destined for human consumption.

B. PROJECT PURPOSES

The purposes of the project as stated in the Project Paper were:

- to introduce and/or adapt technologies appropriate to small farmer and rural resident needs.
- to begin the process of developing an institutional capability in appropriate technology.
- to increase rural employment opportunities through expansion of small rural-based agribusiness enterprises.

1. Assumptions

The assumptions underlying these purposes were:

a. that farmers and other potential users of technology will respond to demonstrations and extension activities and seek to implement the new technology.

b. that developing an institutional capability will be better done using a "bottom-up" approach (i.e., determining what level and breadth of demand for AT exists), rather than first imposing an institutional development strategy and an organizational structure.

c. that small manufacturers will be able to respond to demand for items and make available necessary quantities.

2. Continuing Validity of the Assumptions

Assumption (a) is only partly valid. The majority of farmers will not risk their limited capital on something they have only seen at a demonstration. They must be "sold" on the item or process. It takes active, continuous extension work to promote a new piece of equipment or technology successfully. To understand this point fully, one must remember how long it took U.S. farmers (the most "extended to" farmers in the world) to adopt hybrid corn. The implications for SSAA and its success are that only the best outputs of the sub-projects should be extended at this point.

The outputs of a few projects, however, did catch on rapidly, e.g., the wooden rabbit boxes (sub-project N° 39) and home food processing (sub-project N° 31). In the case of the rabbit boxes, both families raising rabbits and carpenters took up the boxes quickly.

Although slower than a "top-down" approach, Assumption (b) is still valid, for in the Egyptian context it is far more effective. See Section IV, "External Factors" for a discussion of extension in Egypt.

The validity of Assumption (c)[1] is helped if (i) credit is available to the small manufacturer, (ii) he is given a guaranteed

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[1]Project management recognizes this design deficiency and makes efforts to coordinate credit requirements with other projects (SFP and AMP) and with GOE credit facilities.

initial order (see Section IV, "External Factors," for the description of the Small Farmer Production Project's activities with small manufacturers), (iii) the linkage is made at the outset between the manufacturer and the farmers/end-users, (iv) there is a high enough "density" of end-users in the area to make it worthwhile for the manufacturer, (v) the manufacturer has help in adapting the prototype to his shop's equipment and manufacturing techniques, and if (vi) the manufacturer can provide maintenance and spare parts.

Assumptions (a) and (c) entail a sub-assumption which the evaluation team feels is of somewhat questionable validity, namely, as stated on page 20 of the project paper:

> Small manufacturers and users will be the primary extension vehicle beyond initial efforts. The expected usefulness and low costs of most items should facilitate widespread diffusion.

This must imply that an on-going "demonstration effect" was to have occurred all by itself. As stated earlier, extension entails an <u>active</u>, <u>continuous</u> effort. It is reasonable to assume that some "demonstration effect" will occur, but success will require on-going extension. This is particularly true with the small manufacturer. While the farmer may be willing to show his neighbour his new "success," the small manufacturer, if he has gained a competitive edge, is not about to give it up by showing it off.

C. OUTPUTS

The desired outputs of the project were:

- 10 adaptive equipment items or systems extended in the rural sector
- 100 persons from counterpart agencies trained in applications of appropriate technology to local farm problems
- 5,000 farmers and 20 local manufacturers received training
- instructional materials in Arabic prepared for each equipment item
- three in-depth case studies on the process of adaptation and extension of appropriate technology

1. Assumptions

a. appropriate technology equipment and processes exist that can be either developed or adapted to meet local problems.

b. suitable personnel are available and can be trained.

c. effective training and extension programs for manufacturers and users can be developed.

2. Continuing Validity of the Assumptions

Assumptions (a), (b), and (c) are all still valid as stated. What is questionable, however, is that certain desired outputs were to have been achieved in three years. For example, IRRI (the International Rice Research Institute, Los Banos, Philippines) has had a successful mechanization program, but how many years elapsed before they had 10 items which were successfully introduced and extended on a wide-scale? The same type of question applies to the desired output of 5,000 trained farmers and 20 trained local manufacturers. One assumes that these farmers and manufacturers were to have been adequately, if not

well, trained. Assumption (c), for example, should have read "effective training...can be developed, and put into widespread use." Had it read this way, however, it would have been largely invalid, given the length of time and degree of effort needed to reach this number of farmers successfully. This discussion implies that the desired equipment and farmer/manufacturer outputs should not have been set so high and these outputs should have been qualified with the words "successfully" and "adequate," respectively.

VI. PROGRESS SINCE LAST EVALUATION

In the implementation schedule, the Project Paper called for a total of six evaluations, three of which were to have evaluated the technology introduction process used in the project, two of which were to have been annual project evaluations, and at approximately the mid-point of the two years' work to be carried out by the contractor, an in-depth evaluation was to have been done by USAID, MOA, the contractor and outside participants.

As far as can be determined from the various project-related documents and discussions with current project personnel, no formal evaluations of the technology introduction process were carried out. Chemonics, prior to undertaking work on this project, evidently reviewed the technology introduction process recommended in the project paper. The results of their review was a 13 point process to be used in the selection, design, testing, monitoring and introduction of appropriate equipment, process, etc. Chemonics made the 13 point process part of their proposal to provide technical assistance. This was accepted by USAID and MOA as part of the technical assistance contract signed in August 1980.

Evidently, the two annual evaluations foreseen in the projects' implementation schedule were not carried out. A brief evaluation (Pearson, October 25, 1981) of the activities of the SSAA project took place in October 1981 as part of a case study evaluating successful appropriate-technology introductions

in Turkey, Pakistan and Egypt and relating them to the SSAA project activities. It may be considered a mid-term evaluation because Pearson did evaluate the progress of the project until October 1981 (although not in great detail), he made sound recommendations, the GOE paid attention to the report and have acted on many of the recommendations. Discussions with MOA and USAID indicate that no formal evaluations have been done since Chemonics left the project. Following is a summary of the recommendations made in the Pearson evaluation, positive changes made since that evaluation, and valid recommendations made, but as yet not acted upon.

A. Recommendations of the Pearson evaluation[1]

1. The SSAA project should redirect its efforts by giving more subgrants to universities, R&D institutions, PVOs and individuals. Groups who have the ability to provide this service should be well sponsored.

2. Technical assistance should continue to be supplied for all the stages of problem identification, technology development and adaptation, testing, and work with the manufacturer and extension.

3. The SSAA Project should coordinate its activities with the Agricultural Mechanization Project. The Mechanization Project should be aware of all new developments in small mechanical agricultural equipment which emanate from the SSAA project in order to incorporate the mechanization elements of this project into the larger mechanization project in the future.

4. Coordination should be increased between the SSAA project and the Small Farmer Production Project to organize credit and extension for new technologies being developed.

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[1]USAID/CAIRO, " Approaches to Appropriate Agricultural Technology in Egypt: A Special Case Study Evaluation," Robert W. Pearson, October 25, 1981., pp. 30-31.

5. A socio-anthropologist should be hired to analyze socio-cultural problems for needs assessment and to give greater direction to the forthcoming extension efforts.

6. Emphasis should be placed on the use of small rural workshops for the fabrication of new prototypes and all stages of production for new technologies.

7. Emphasis should be placed on in-country training and extension.

8. As a service to all agencies and institutions actively involved in AT in Egypt, the ATTF should organize a forum on AT to coordinate efforts and serve as a resource and information center.

9. A branch of the MOA or attached institution should be identified as the coordinating, information center.

B. Positive Changes Made Since The Evaluation

Since the Pearson evaluation there have been important positive changes in the SSAA project. The principal change is the large number of sub-projects now under way and the shift in focus of the project to encompass more than mechanical solutions, i.e., toward income-generating activities, rural development, women, animal production, etc. Certain of the new sub-projects (e.g., food processing, raising rabbits, silk production, aromatic and medicinal herbs production) are being implemented successfully, but they are not yet widely diffused.

Many new sub-projects were introduced over the period March-June 1982 with the MOA management reorganization of the SSAA project. Thus, project management widened its focus to six general areas of activity, and took a more integrated approach which included a number of income generating sub-projects. This followed the report of the Pearson evaluation that "As of May 31, 1981, the MOA only spent LE 21,193 or 2.5% of the funds available for

a period that constitutes 42% of the project time." [2] In retrospect, given the amount of time the project then had to completion and knowing the length of time it takes for the entire design-extension process, the evaluation team feels that project mangement would have been well advised to have selected fewer sub-projects with greater chances of success, both in extending to end-users and for managing, administrating and following up the sub-projects. Today, with the funds almost totally spent, there are a large number of sub-projects which are in the early stages of the extension process, appear to have merit, yet haven't had the acid test of end-user acceptance.

SSAA project management is of the opinion that it was necessary to start many sub-projects given the short length of time then available (PACD extensions had not yet been requested) to make significant progress toward successful completion of the project and given the fact that expenditures up to May 31, 1981 had been very slight. Management also is of the opinion that there is no relationship between the number of sub-projects and the project completion date because each sub-project is a separate "entity" and has its own "contract" with the SSAA project. They feel that this fact makes for rapid execution, but say that overall supervision is more difficult.

Coordination between this project and the Small Farmer Production Project appears to have increased. In the preceding section, "External Factors," the adoption of economically viable

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[2]USAID/CAIRO, "Approaches to Appropriate Agricultural Technology in Egypt: A Special Case Study Evaluation, " by Robert W. Pearson October 25, 1981, p. 29.

(for the farmer) equipment/processes developed by SSAA was discussed in some detail. Both credit and extension are available under SFP.

Coordination of technology introduction with the AMP has taken place as evidenced by that project adopting the chisel plow (developed in the first sub-phase of SSAA), the self-powered field sprayer, the fine leveller, and havesting equipment.

Some progress has been made in the use of rural work shops and entrepreneurs in the cases of few sub-projects, e.g., local carpenters producing rabbit boxes in the Mallawi area, plastic green house frames are shaped at local workshops. The bulk of prototype development is being done in the SSAA workshop and in some private workshops.

Emphasis has been placed on in-country training and extension in so far as numbers of people reached. Once again, it must be pointed out that at the time of the management reorganization, the project had only 1 1/2 years left and with the most recent extension, 2 1/2 years. This is a short period of time to expect the entire developmental process including effective, widespread extension to take place. In particular sub-projects, training and extension are being effectively done, e.g., food processing, silk production, foliar fertilizer application, siphon tubes.

Finally, small scale agricultural activities will be continued under the aegis of the Agricultural Mechanization Research Institute. What is unclear at this point is whether the institute will be able to carry on non-mechanical activities such as some of the animal production and plant production subprojects, food

processing and certain facets of the rural development sub-projects such as literacy training.

C. Valid, But As Yet Unacted Upon Recommendations

1. Technical Assistance. Pearson's recommendation regarding the need for on-going technical assistance for the entire problem identification-to-extension process is certainly valid, but could not be acted upon. According to project management, problems of budget allocation in relation to the time left to complete the project (most of the funds for technical assistance had been spent before MOA management took over), the time involved in unsuccessful negotiations between Chemonics and MOA, plus the time that would have been required to locate and obtain two specialists, caused MOA to turn to universities for assistance on sociological questions. Two qualified, Arabic speaking, specialists were needed in the areas of industrial extension and rural sociology.

Unfortunately, in terms of technical assistance, no base line socio-economic survey was ever made, therefore no rigorous needs assessment carried out. The needs assessment, or problem identification, from the socio-economic stand point of the end user is key. In addition, evaluations and surveys of application of technology as well as rates of diffusion and acceptance among farmers are needed. To date, no formal system has been developed which identifies those sub-projects which have been most successful and most amenable to productive widespread replication, and which identifies why some activities are more successful than

others.

Some extension to the small rural manufacturer has been done, but the experience of the SFP project as stated in Section IV, "External Factors," demonstrates that you can not expect the small rural manufacturers to start producing new items of equipment without credit to tool up, without a guaranteed first order to "prime the pump," and without explicit linkages being made between him and the end-users.

2. Socio-anthropologist. This recommendation is definitely valid and unfortunately could not be acted upon. See discussion on Technical Assistance in No. 1 above.

3. Use of Small Rural Workshops. This recommendation is still valid with the qualification that efforts similar to those made by the SFP project (see Section IV, "External Factors") be undertaken. To date, under SSAA there has been some linkage made to rural manufacturers. Distribution of prototype equipment directly to farmers is made in those cases where the item has to be produced in large quantities, e.g., siphon tubes which must be ordered in lots of 500 or more.

4. Emphasis on in-country training and extension. This is still a valid recommendation, which for some sub-projects is being emphasized. The important point is that there must be suitable equipment/processes developed to be extended.

5. A Forum as a Resource and Information Center. One of the outputs of the project was to develop an AT library and data bank - as a resource and information center "housed" in the SSAA project. Also, such a center was to stimulate AT development and avoid unnecessary duplication of efforts by different projects and donors. That a forum be the research and information center is open to question. The last recommendation of Pearson that some branch of the MOA or attached institution be the information center is more appropriate.

VII. INPUTS

This section address the adequacy and use of the inputs to achieve the desired project outputs. The statement of work specifies that the evaluation team should:

- o Comment on the funding and staffing provided to achieve the outputs.

A. Technical Assistance. The funding and staffing of the long term part of technical assistance were at planned levels and the levels were felt to be adequate for what was to have been accomplished by Chemonics. The principal problem was the shortness of time to achieve the project objectives. One of the lessons of the project is that the time required for the process of problem identification to problem solution/extension to end-user takes longer than three or five years. Unfortunately, insofar as the time element was concerned, additional delay occurred due to the SSAA management reorganization and subsequent sub-project portfolio review. During a three month period, most project activities were suspended, while the entire portfolio of sub-projects - old and proposed - were reviewed for continuation and selection purposes.

Since MOA has assumed complete management of the project, the number of AT introductions has increased to the point where desired output has been more than met. The evaluation team is of two minds on the matter of introductions. It understands the need for project activity in order to reach output objectives, but at the same time it sees a need to select activities based

on empirical field research done. Given the relatively short time frame of the project, even with extensions, and the lack of design emphasis and funding put on one-on-one (extension agent to farmer, extension agent to small, rural manufacturer) extension and in-country participant training, the team feels that fewer sub-projects with greater chances of gaining widespread acceptance would have been a better strategy.

In the case of short term technical assistance, while the funding level appears adequate, not all the technical expertise materialized. Specifically the agricultural extension and industrial extension specialists were not contracted for. Equally important, a rural sociologist was necessary. The lack of the sociologist resulted in the absence of a socio-economic base line survey which would have included a needs assessment of potential end users. These would have provided bench marks by which to measure project progress, and the mechanism for information feedback from end users which would have been helpful in making project course corrections and in more accurate selection of new sub-projects to undertake.

The agricultural extension specialist would have assessed the sub-project outputs for widespread adoption potential, would have determined future extension efforts necessary, determined target groups of end-users, and would have coordinated his work with that of the industrial extension specialist.

The industrial extension specialist would have assessed existing rural workshop capabilities and needs, analyzed sub-project outputs for potential production in rural workshops,

and would have determined what was necessary for production, maintenance and repairs of equipment. He also would have been useful in helping project management focus on not only the growth of the farmer end-user, but also the small rural manufacturer (a principal target of the project) and how best to link the two together.

B. Training. There are two categories of training in this project - training targetted to participating agency personnel, and training/extension aimed at end-users - namely, small farmers and small, rural manufacturers.

1. Participating Agency Personnel Training. The training of participating agency personnel only entailed a limited program of off-shore training tours in which 20 persons were to have benefitted from this training. The funding earmarked for this activity was adequate, but the activity did not take place in its entirety. Only eight individuals received this training and two of the five planned trips never materialized. One of the three trips that was made was made by the RA alone. As a result, only one individual of the current SSAA management team has had this exposure. The conclusion is that this component had limited effect on output achievement.

A shortcoming of the project design (and concomitant funding) was that it did not allow for in-country training for project participants to learn how to extend what had been developed in the sub-projects. The training in the development of AT

items/processes which took place was part of the long term technical assistance provided and funded, but no funds were explicitly budgeted for training in the extension process. In mid-may 1983, the Project Grant Agreement was amended to reallocate some $76,000 to "...institute limited training to assist the project in reaching the target rural communities."[1]

The project had only one year left before its PACD, which did not allow sufficient time, in the opinion of the evaluation team, to achieve the training desired and make its effectiveness felt in the target rural communities. The desired effect was also hindered by limitations on the training/extension effort directed at the end-user - small farmers and small, rural manufacturers, the next topic.

2. Training and Extension for Small Farmers and Small Rural Manufacturers. While there was no requirement nor time to perform a financial analysis of the project, it appears that the funding and staffing for the overall component was adequate. What is evident, however, from the MOA 1982-83 Annual Report of the SSAA Project is the small percentage (5.2%) devoted to direct extension to the end-user. This is understandable given the Project Paper statement (pg. 9) - "Once an item is adapted to the Egyptian environment, the Project will support initial efforts to extend the technology to the target population of users." The project paper further states, "It is prepared

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[1]USAID/CAIRO memorandum, re amendment of Annex 1 of the Project Grant Agreement, dated May 15, 1983 and approved on May 22, 1983.

to maximize the role of local extension groups."

The underlying assumption was that once demonstrated, farmers and small, rural manufacturers would adopt items/processes, thus there was not much need for one-on-one extension work, and what extension had to be done vis-a-vis the farmer would be done by the MOA Central Extension Service. The Central Extension Service, however, was mandated only to extend those items/technological packages that had been approved by the top management of the Extension Service. SSAA project output was considered "adapted research" and without review and approval by the Central Extension Service, SSAA could only avail itself of logistical help from the Extension Service. This limitation was side-stepped to a degree by including village level extension agents on sub-project teams with the same incentives that sub-project team members received. The assumption coupled with reliance on the Central Extension Service hampered sufficient output achievement.

C. Commodities, Local Costs in LE, and MOA Input

Commodities' funding was at planned levels and adequate. Local costs in LE have been discussed in Part A above. Another element of the LE financing was that of Instructional Materials. Some 32 pamphlets on equipment items produced were published and 127,000 copies in all were printed, and most were distributed to the Central Extension Services for subsequent delivery to potential end-users. In addition, 16 videotapes on various sub-project activities and four short television shows were prepared. It is difficult to judge how much each of these categories

of instructional "materials" contributed to achievement of project outputs, except to note that the videotapes, based on the evaluation team's interviews of farmers, were well received.

With respect to the MOA contribution of staff, facilities and operating funds, the facilities and operating are considered to have been adequate. The staffing portion of the MOA contribution was strong on the technical side, but could have used assistance on the management side in so far as establishing a management planning, control and information system for the project, due to the sheer number of sub-projects to manage. It may well be that the long term technical assistance package should have had a smaller technical component and a greater managerial component to it.

VIII. OUTPUTS

This section measures the progress the project has made in attaining the projected output targets specified in the logical framework. The statement of work requires that the evaluation team:

- o document the activities ("prototype solutions") developed, and comment on their appropriateness, replicability, cost effectiveness and adoption by farmers or entrepreneurs todate.
- o document the extent and nature of training, and comment on its usefulness.
- o assess the effects of training and extension directed to local equipment manufacturers and small farmers using the equipment, as well as assess the instructional materials that have been developed.
- o assess the data and information component to determine if an effective system of evaluating equipment and processes amenable to widespread replication has been developed and if appropriate institutions have been identified through which AT activities could be continued.

Following are the outputs which were expected, the progress made to date for each category of outputs, the team's findings[1] and conclusions, and at the end of this section, recommendations. Below is a table showing the distribution of SSAA activities across the range of priority needs of Egyptian agriculture.

A. Equipment Items/Systems

- o Ten Adaptive Equipment Items or Systems Introduced.

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[1]Appendix No. 6 describes each sub-project and answers levels of achievement (appropriateness, replicability, cost effectiveness, adoption and effective use) as well as progress, given the time and information constraints the team faced.

SSAA Project and the Priority Needs of Egyptian Agriculture

	Priority Needs of Egyptian Agriculture[1]	SSAA Sub-projects Which Apply
1.	Increase food production to meet increasing food demand	2, 3, 5, 6, 9, 12, 13, 16, 17, 19, 20, 22, 23, 28, 32, 33, 37, 38, 50, 41, 42, 44, 48, 54
2.	Increase the efficiency of animal production	8, 26, 27, 39, 52
3.	Increase yields on available land	2, 3, 5, 6, 9, 17, 20, 22, 28, 33, 40-44, 47, 54
4.	Increase production of agricultural commodities in which Egypt has a comparative advantage for export	1, 7, 10, 13, 22
5.	Increase production of agricultural commodities to substitute for imports	23, 26, 27, 36
6.	Increase private sector activity, in particular agro-industry	all projects which involve small rural manufacturers, other manufacturers
7.	Increase employment	same as No. 6 above, plus those sub-projects which with extension will require agricultural labor; specific projects are 7, 11, 16, 30, 31, 34, 46; 50 and 51 to the extent that they incorporate the food processing activities of sub-project No. 31

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[1]As expressed by Dr. Youssef Wally, Minister of State for Agriculture and Food Security in "Highlights of Agricultural Policy in Egypt," a speech given to the American Chamber of Commerce, Cairo, February 21, 1984, and The Report of the Presidential Mission in Agricultural Development in Egypt, MOA and USAID/Cairo, July 1982, pp. 1, 5, 11.

1. Progress to Date.

a. 12 equipment items/systems/processes introduced and starting to be increasingly extended to end-users. (sub-projects 1,2 (includes 9), 5, 13, 22, 31 (includes 30 and 46), 33, 39, 40, 41, 42 and 52).

b. 13 equipment items/systems/processes introduced and in early stage of extension (sub-projects 8, 16, 17, 19, 26, 27, 32, 37, 38, 43, 44 48 and 52).[2]

c one sub-project (No. 7) is a continuation of another organization's (Catholic Relief Services) activity that is on-going.

d. sub-projects 50 and 51 include other successful sub-projects as well as literacy and nutrition education components.

2. Findings.

The findings are the team's assessment of levels of achievement according to five criteria: Is the activity appropriate to local needs, can it be replicated at a reasonable cost, is it cost effective when compared with the traditional activity, has it been adopted by the small farmer and by the small, rural manufacturer, and is it being used effectively by the end user? It should be noted that not all of the criteria are applicable to all of the sub-project activities as is indicated in the foregoing table. Also, in the case of certain sub-projects, the success of the sub-project in meeting individual criteria is qualified. Findings are presented for each of the six groups of sub-projects established by the MOA.

a. Group No. 1 - Irrigation, Fertilization and Soil Preparation (sub-projects 2, 3, 5, 9, 17, 42, 43, 48)

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[2]In addition, the output of sub-project No. 3 is about to be extended to farmers.

i appropriateness. All of the Group 1 sub-projects were judged to be appropriate for the small farmer.

ii replicable at reasonable cost. All but four were found to be replicable at reasonable cost by the small farmer/small manufacturer. The four which were not were the two levellers (No. 3 and 48), the sprinkler irrigation device (No. 17) and the drip irrigation equipment (#42). These were judged to be affordable only by the large farmer, a cooperative, or in the case of the levellers, those farmers with access to tractor services.

iii cost-effective. All of the sub-projects in this group were judged to be cost effective when compared with the traditional activity/method/process.

iv adoption. In most cases, farmers were adopting or starting to adopt the sub-projects' outputs. The secondary tillage equipment (sub-project No. 3) is out of the prototype stage and will soon be available to farmers through the SFP project. There has been initial adoption of the outputs of all but one of the sub-projects in this group by small manufacturers. For most sub-projects of this Group, one workshop is producing; for projects No. 17 and 48, two private workshops are involved.

v used effectively. Where the output is in use, it is used effectively. In the case of the output of (sub-project No. 3), it can be used effectively.

b. Group No. 2 - Plant Production (sub-projects 6, 10, 13, 18, 20, 22, 23, 28, 33, 36, 40, 41, 44 and 54).

i appropriateness. Most of the sub-projects were judged to be appropriate for the small farmer.

ii replicable at reasonable cost. Most were felt to be replicable by the small farmer/small manufacturer except for the motorized equipment which is imported (sub-project No. 6).[3] Replicability could not be determined for three sub-projects.

iii cost-effective. Most of the sub-projects were felt to be cost-effective.

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[3]The sickle bar mower developed under this sub-project is replicable at reasonable cost and is being adopted by farmers.

iv adoption. Eight of the sub-projects' outputs have been adopted, three were not yet in use.

v used effectively. Those which have been adopted have been used effectively.

c. Group No. 3 - Animal Production (sub-projects 7, 8, 15, 26, 27, 34, 39 and 52)

i appropriateness. All the sub-projects of this group, except No. 15, the small-scale incubator and brooder, were felt to be appropriate.

ii replicable at reasonable cost. All but No. 15.

iii cost-effective. All were felt to be cost effective. Sub-project No. 7, silk production, is the traditional activity.

iv adoption. Most are beginning to be or are being adopted by the small farmer. In most cases, the activities do not lend themselves to manufacture.

v used effectively. Where they are in use, they are being used effectively.

d. Group No. 4 - Food Industries (sub-projects 16, 19, 30, 31, 32, 37, 38 and 46).

i appropriateness. All the sub-projects are appropriate.

ii replicable at reasonable cost. All are replicable except sub-project No. 38 - Production of Better Quality Milk (the separator).

iii cost-effective. All the sub-projects of this group were felt to be cost-effective.

iv adoption. Where applicable, small farmers are beginning to adopt the output.

v used effectively. Where they are in use, they are being used effectively.

e. Group No. 5 - Pest Control (sub-projects 1, 35 and 45).

i appropriateness. The three sub-projects' outputs are appropriate.

ii replicable at reasonable cost. Sub-project No. 1, Pheremone Traps, is replicable at a reasonable cost. Replicability is unknown for sub-project

#35 (still in the prototype stage) and for sub-project #45.

iii cost-effective. Sub-project No. 1 - yes; sub-projects No. 35 and 45 - as yet unknown.

iv adoption. In the case of No. 1, some farmers have adopted the traps, and one small, rural manufacturer is making them. Sub-projects 35 and 45 are not yet in the adoption stage.

v used effectively. No. 1 - yes; Nos. 35 and 45, not yet.

f. Group No. 6 - Rural Development (sub-projects 4, 11, 14, 21, 49, 50, 51 and 53).

i appropriateness. Only the outputs of sub-projects 50 and 51 were deemed to be appropriate. The biogas generator (sub-project No. 4) was felt to be appropriate only in those cases where the farmer suffered lack of timely availability of propane. The agricultural buildings (sub-project No. 49) were felt to be inappropriate for small farmers, and the water units (sub-project No. 14) were questionable. No. 53 may become appropriate.

ii replicable at reasonable cost. Nos. 50 and 51 are replicable at reasonable costs. No. 4 and 49 are not, and No. 14 is questionable.

iii cost-effective. Nos. 50 and 51 were judged to be cost effectively while Nos. 4, 14 and 49 were not. No. 53 is assumed to be.

iv adoption. Adoption has only taken place in the cases of those sub-projects (50 and 51)[4] which include mainly the sub-projects from the Food Industries Group and which are aimed at rural women's activities and at development in the North and South Sinai.

v used effectively. See iv above.

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[4]See footnote No. 2, page 24 for discussion of the condition under which the biogas generator (sub-project NO. 4) has been adopted.

3. Conclusions.

The project certainly met, and even exceeded, the desired outputs in terms of quantities of equipment items, systems, and processes introduced. What is more germane, however, is the extent to which the outputs have been adopted by end-users and small, rural manufacturers. In the case of the former, one could characterize the success as modest, given the limited time the project has had to complete its activities, and in the case of the latter - limited.

In general, most of the sub-projects were appropriate to the needs of the small farmer and the end-user. Only two sub-projects were felt to be totally inappropriate. The biogas generator was felt to be region-specific in appropriateness. Replicability at a reasonable cost was a criterion generally met, with the exception of certain sub-projects which were felt to be replicable only by larger farmers, groups of farmers, those with access to sufficient credit, or in cases where the farmer had to and could hire tractor services.

Most of the outputs, when compared with the traditional activity, were judged to be cost-effective. In some cases, the team was able to obtain hard data for the sake of comparison. In those cases, where data was not available, qualitative judgements were made.

Adoption by small farmers and women for a few outputs is beginning to spread. For most outputs, however, adoption is either just starting or has not yet started. Adoption by small, rural manufacturers is extremely limited overall. In most cases

where the output is being used, it is used effectively.

In effect, the SSAA project has two small farmer populations. The first is the uneducated farmer who owns one to five feddans and may combine holdings with a male relative thus sharing anywhere from two to ten feddans. These farmers have benefitted from the less expensive, simpler innovations of the project. A farmer from this group with more than five feddans could take advantage of several project innovations, for example the land leveller (rent/borrow) for long furrow agriculture coupled with the use of the siphon tubes for irrigation.

The second farmer population is the larger, wealthier and sometimes well-educated farmer. This population includes the "rural returnees" - college trained farmers who are encouraged by the government to return to farming. This second group would tend to adopt the more sophisticated, expensive innovations of the SSAA project.

B. Counterpart Agency Training

- 100 persons from counterpart agencies trained in applications of appropriate technology to local farm problems.

1. Progress

210 persons from counterpart and cooperating agencies and institutions have received varying degrees of training in the application of AT. In addition, an unspecified (by MOA) number of extension agents have received exposure or training

in AT application. Eight individuals participated in three third country visits to learn about other countries'/organizations' efforts in the AT field (the project paper, p.8, called for 20 individuals to receive off-shore training).

2. Findings

a. Off-shore Training. The objective of the off-shore training was not only to examine equipment and components/processes that would have merit for small farmers in Egypt, but also to improve the abilities of project personnel to identify and develop AT for Egypt. Off-shore training was comprised of a visit to the United States by the three project principals (including the RA) in November/December 1980, a visit by the RA to Israel in September 1981 and a visit to Pakistan, Thailand and the Philippines in November 1981 by the RA, Project Director, Extension Officer, one ATTF member, an individual from Tanta Motors and one farmer. Planned visits to East African and Mediterranean countries/AT centers never materialized.

b. In-country Participant Training

The objective of participant training in Egypt was to provide on-the-job training for people working on the project.

i. Model Shop. The project established a model shop to carry out research and development of appropriate technology equipment items. The model shop was to have been a replica of a village workshop insofar as it contained similar equipment for the local manufacture of equipment for small farmers. During

the initial phase of the project, model shop output was low and at times equipment was built that was not in the scope of the project. At other times, it was used to produce more than just prototypes. This was contrary to the concept of the model shop - development of prototypes under simulated village work shop conditions for eventual transfer (upon successful testing, modification and retesting) to the village work shop for production.

During the last half of 1981, the model shop's performance improved noticeably - with increased participation by sub-project personnel, and by appropriate sub-project work being done. At the time of the SSAA project management reorganization, workshop activities were suspended.

Since the time of the reorganization, prototype development has been done largely in the MOA model shop, and small private workshops are starting to become invovled in prototype refinement and subsequent manufacture for a growing number of sub-projects.

ii. Training in Application of AT. During Chemonics' tenure with the SSAA project, in-country training of SSAA project personnel took the form of informal, on the job training in technical matters, management and administration of the project, and in compliance with USAID requirements. While it was assumed that the MOA Central Extension Services would undertake extension to the end-user, lack of adequate staff, no capability for rural industrial extension and several reorganizations prevented it from doing so. Close liaison, however, was maintained through the Central Extension Service's participation on the ATTF to keep abreast of SSAA sub-projects and their potential for extension.

During the course of the MOA phase of the project, participant and cooperating agency training, under the aegis of the SSAA Central Extension Committee, took the forms of symposia for university faculty members and SSAA sub-project investigators and extension agents by classroom and/or field demonstrations. "Leading farmers" and other farmers participated in field demonstrations. Reportedly, all sub-projects out of the prototype stage had at least one "training" session for the individual sub-project's activity. These training sessions ranged from a minimum of showing a few key farmers how to care for seedling trees, or showing rural university students who were to return to their villages and act as informal extension agents how to use a seed drill, to a week long training session for 36 extension agents and leading farmers, entailing in-field demonstrations and village meetings (sub-project No. 2 - irrigation siphon tubes).

According to project management, there was only one week-long symposium ("A Symposium on Introducing the Technology Suitable for the Egyptian Village," November 1982) devoted in part to effective communication, teaching and extension methods for members of the sub-projects who would be imparting information to farmers and to extension personnel. The bulk of each day's activities consisted of technical aspects of the sub-projects, followed by an open discussion which also covered extension techniques. This might be called informal training on subject matter in a formal situation.

The SSAA project Annual Report (1982-83) states that 40 specialized training sessions of 2-11 days each were to be held for a total of 800 key people-called "rural trainees." As of the end of June, 1983, 33 sessions with 613 attendees had been held. These "rural trainees" were largely end-users (farmers, women) who would then spread the knowledge of the technologies to other potential end-users.

A training program was prepared by the MOA Training Authority under the guidance of the SSAA project to train those people who would have direct contact with the end user. There is need, however, for formal opportunities for retraining and for "lateral learning" (where extension personnel share teaching and work experiences, both good and bad, and thus learn from each other.

3. Conclusions.

The majority of the project activity has been to develop/adapt equipment, processes and technologies. The management reorganization, following the October 1981 Pearson evaluation (which stated that only 2.5% of the funds had been expended during 40% of the project's duration) led to a virtual restart of the project and the start-up of many new sub-project activities. Therefore, with some 50 new or almost new (a few activities were transferred from the Chemonics phase of the project) sub-projects, there was little time or funding to do

a complete job of participant training.[4]

In spite of the lack of completeness, the training that did take place, coupled with the appropriate educational/work backgrounds which the sub-project principal investigators have has resulted in an improved ability among participating agencies/ organizations to identify and develop AT. This is evident from the fact that of 54 sub-projects approved, only three were never started, of the remainder, the evaluation team found only four to be inappropriate, and 31 have started to be extended. Furthermore, today's sub-projects encompass much more than mechanical items. They entail plant and animal production technologies, pest control, food processing and rural development activities. Many sub-projects directly entail income generating activities.

It is unfortunate that the remaining offshore training did not take place, for most of today's project principals have not had the opportunity to see first hand what others are doing. Such exposure is a source of ideas and a spur to creativity.

For participant training to have been more effective, a program of sequenced formal and on-site training would have been very appropriate. Such a program would have involved (a) formal training in the entire development-to-extension process of AT while equipment and processes were being developed, followed by (b) on-site training and initial extension of the equipment/ processes as they came out of the prototype state, (c) field-testing

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[4]In fact, there was no local currency provided for in-country training in the grant agreement. On May 15, 1983, USAID/Cairo approved an amendment to the Project Grant Agreement to reallocate local currency funding to accomplish in-country training.

leading to refinements if necessary, and (d) final on-site extension with provision for information feed back to determine success levels and adoption rates. Moreover, there would have been opportunity for participant training and "lateral learning" among the trainers/extension agents. Coincident with this program would have been the work and input from the planned for agricultural and rural industrial extension specialists.

C. Farmer/Equipment Manufacturer Training and Extension

- o 5000 farmers and 20 local manufacturers to have received training.
- o demonstration programs to have been carried out for each equipment item, machine or process introduced.
- o Instructional materials in Arabic to have been prepared for each equipment item.

1. Progress

a. Approximately 1,700 farmers and 650 women have been exposed to the equipment and processes of the SSAA projects and have received varying degrees of training. An estimated 40 small rural manufacturers are engaged in various levels of production of the equipment outputs of the project.

b. For most equipment items and processes that have come out of the prototype stage, demonstration programs, even if they were only part of a "field day" (e.g., sub-project No. 6, Manual and Motorized Equipment for Harvesting Field Crops) have been carried out.

c. For most of those sub-projects which entail equipment items and which have passed out of the prototype stage, instructional materials have been prepared. 32 booklets in Arabic have been printed for a total of 127,000 copies. In addition, the project held 26

extension workshops in the field and at universities, developed 16 video tapes of selected AT activities and contributed four television programs on SSAA project developed appropriate technology.

2. Findings

a. Farmers. In general, the extension efforts such as field demonstrations and village meetings for farmers were conducted by members of the sub-project teams. Because most of the SSAA sub-projects are in the realm of "adapted research" and are not MOA Central Extension-approved packages, the Village Extension Agent (member of MOA Central Extension Service) does not extend the sub-project's output. He only promotes programs which come down to him from the Director General (national level) via the Governorate and District Levels. He will, however, help select the meeting site, suggest key farmers to invite and help with the local logistics of the event.[5]

The proposed training program for farmers was in practice accomplished by the various sub-projects to the degree that they "trained people." Some sub-projects such as No. 9, "Increasing the Efficiency of Border Irrigation," did conduct field teaching where farmers were shown and then used a siphon tube to cause water to flow from an irrigation ditch to a field. A few sub-projects did not go this far, but then some of them have not yet reached the point where extension is appropriate.

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[5]SSAA attempts to utilize village/governorate level extension agents as members of the sub-project teams to guide the extension work to the farmer in individual villages. He receives an incentive as do other team members.

Another training program was approved by the SSAA project for Governorate, District and Village Level Extension ("agricultural engineers") personnel. Unfortunately, this program was cancelled for four groups of sub-projects because of cost factors.

The effectiveness of training and extension varied considerably. For those sub-projects which were obvious money-makers for the end-users, e.g., rabbits, silk production, extension was very effective - judged by the numbers of adopting end-users. For other sub-projects, extension has not yet been this effective.

There have been two basic approaches to farmer training: (a) on-site training conducted at local MOA centers in the case of most farm machinery, or in local MOA laboratories in the case of food processing activities including dairy; and (b) "on-farm" (or in-home) training - an activity which often serves as follow-up to specific "on-site" training sessions. Jam and juice concentrate manufacture (sub-project No. 31) is a good example of "on-site" training followed by "in-home" extension.

The on-farm training includes, for example, the delivery to the farm of prototype machinery, seedlings, plastic sheeting and galvanized pipe for greenhouses, foliar fertilizer solution, etc., and an initial demonstration/discussion. SSAA follow-up personnel are obliged to visit each sub-project activity at least once monthly.

The training and extension directed to the farmer has unquestionably stimulated his motivation to use the innovations and use them effectively. In the cases of the more expensive and less accessible (to the small farmer) types of equipment and

processes, use has extended very little beyond the "model-farmer" stage - where the sub-project output is furnished free of charge by the project to the "farmer demonstrator."

Where adjacent farms are co-managed by paternal brothers there is an almost assured spread of equipment use. In the case of household food processing, rabbit rearing and silk production, demand for the end products has encouraged constant application and thus skill retention levels have been maintained. These activities have also enjoyed considerable replication and diffusion.

b. Small Rural Manufacturers. Underlying the desired training of and extension to small rural manufacturers were the following project design assumptions:

i. that the organizations and personnel must be active in project implementation, i.e., universities, research centers, academics, government staff would be adequately suited to the task of establishing and maintaining links with small rural manufacturers.

ii. that Egyptian project counterparts shared the same perspective on the role of the small rural manufacturers.

iii. that the small manufacturers would require no more incentive than the logic demonstrated of a particular machine's efficiency and the consequent demand to exist among local farmers.

iv. that an extension capacity existed for the follow-up and encouragement of small manufacturers.

v. that prototype equipment distributed to "farmer-demonstrators" and demonstrated would kindle demand

among farmers, who would then turn to the local manufacturers who, in turn, would have the physical (production) and financial capacity to produce equipment consistently and profitably, while at the same time provide repair facilities and spare parts.

What happened was not quite what was assumed would happen. First, the most consistent and widespread application of newly introduced equipment and processes occurred from the use of those innovations which:

a. were easily constructible on the village level, which the farmer could make (or control the process), or pay a carpenter to make (rabbit boxes, beehives, cheese processing boxes) or

b. were supplied directly to the farmer by the sub-project at project cost which had been manufactured by larger firms. As more farmers sought these innovations, orders were placed through project personnel to larger companies which would handle such production, e.g., siphon tubes, plastic bags and heat sealers for processed foods, plastic greenhouses, and plastic pipes for irrigation (the Sherif Company, a larger firm).

In some cases, scale and cost considerations resulted in the choice of a larger manufacturer who had access to the materials and could do the job with minimal tooling up, and had little need for credit and little concern about the additional risk. The loss is the lack of business between farmer and small rural manufacturer that had been hoped for.

c. Instructional Materials. 32 booklets were published in Arabic and aimed at the extension worker and the literate members of farm families. It was difficult to assess the impact of the booklets. During interviews with farmers the booklets were rarely referred to. What clearly had a discernable impact were the videotapes. Videotapes are understood by literate and illiterate, are less abstract than printed material, and imply modernity and acceptability. Also "seeing is believing."

3. Conclusions.

On the farm level, training in the use of equipment has been carried out mostly by principal investigators, sub-project staff and occasionally by farmers themselves who have become sufficiently adept in their use. The extension component must be described as relatively modest. A heavy load of extension requirements have been placed on technical personnel who have little experience in extension, either professionally or on the job. Additionally, the Central Extension Service is closed to SSAA project use until an output is accepted by Central Extension for widespread diffusion.

Extension offered by the SSAA project has kept interest alive but has not yet succeeded in causing any widespread adoption. Much has depended on either the replicability of a given technology on the village level or easy access to the technology already made.

Because of the flawed assumption regarding the adoption of the small manufacturer of project output for production, it is evident that the priority of small manufacturer involvement

was perceived as part of a chain linking principal investigators to an end product and the distribution of this product to the farmer, rather than as a means to stimulate growth of the small, rural manufacturers through farmer demand. The result is a scattered, sub-project specific approach to small manufacturer participation. Moreover, the actual amount of time available for implementation of the SSAA project precluded sufficient time for any demonstration effect, spontaneous copying on the local level, etc. Further, for most of the sub-project equipment outputs, the small manufacturer needs credit, a guaranteed initial order, and linkages established between him and the farmer.

D. Data and Information Component

- Three studies available on the process of adaptation and extension of appropriate technology.
- Effective system developed to judge those items and methods most amenable to productive widespread replication (additional to logical framework).
- Appropriate institutions identified through which appropriate technology activities could be continued (additional to logical framework).

1. Progress to Date.

   a. The output of three studies (case studies) on the process of adaptation and extension of appropriate technology was dropped at the conclusion of Chemonics' work with the project. (USAID/CAIRO cable 11969 dated 15 April 1984).

   b. An effective system was established by the contractor Chemonics in March 1980.

c. An appropriate institution, the Agricultural Mechanization Research Institute, has been identified.

2. Findings

The project paper called for (... project-funded in depth and case study evaluations of successful and unsuccessful introductions.[6]" Three in depth evaluations of the technology introduction process were to have taken place during the project. In addition, two annual evaluations were scheduled. None of "these evaluations took place. The only evaluation done was that carried out by Robert Pearson in October 1981 which dealt in part with the SSAA project. Moreover, no case studies were carried out.

Chemonics, in the opinion of the evaluation team, did establish an effective system for judging equipment items, methods and processes most amenable to productive widespread replication[7]. Part of the rationale of the 13 point system established by Chemonics was to obtain information which would have been the basis for the case studies of adaptation and extension of AT. Since the departure of Chemonics, no formal system has been developed which identifies those sub-projects which have been amenable to widespread replication nor why particular activities are more successful than others.

Also, appropriate institutions to continue AT activities

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[6]USAID/CAIRO, "Project Paper: Small Scale Agricultural Activities 263 - 0096," April 1979, p. 9.
[7]Chemonics International Consulting Division, "Final Report for the Small Scale Agricultural Activities Project," Washington D.C., April 29, 1983, p. 13.

were to have been identified. The recently established Agricultural Mechanization Research Institute has been designated as the "home" of AT activities after the PACD of the SSAA project.

There were other elements of the data and information component of this project which deserve comment. It was envisaged that a data bank on AT would be developed, to be comprised of an AT library and a small computer (HP-85). According to the Chemonics' quarterly reports, approximately 200 titles had been purchased and received and another 100 titles had been donated. Apparently, in the transition to the new management team of MOA - SSAA, these library materials were lost.[8] The decision to purchase the computer[9] reportedly was rescinded by the current management of the SSAA project on the grounds that it was a low priority item given the short amount of time left for the project.

In addition to the data bank that was to have been established, informal information networks were to have been established, both overseas and within Egypt. These networks were for information exchanges with other AT centers, and other projects/donors in Egypt carrying out AT work. Early in the project, some 30 overseas AT institutions were contacted to establish information exchange and to help SSAA plan for its proposed third country participand training.

The Chemonics' Resident Advisor did a great deal of contact work within Egypt during the first year of Chemonics' tenure with the project. The SSAA project collaborated with USAID/MOA's

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[8]Chemonics International Consulting Division, Quarterly Reports No. 1, p. 9, No. 2 p. 10, No. 6 p. 21.
[9]Quarterly Report No. 5, p. 5.

Rice Research project, Agricultural Mechanization Project, the Catholic Relief Services efforts, the University of California solar applications project, and the Agricultural Development Systems Project of FAO.

He instituted contacts with the Engineering and Industrial Design and Development Center (Giza) for furture industrial extension development. The center assisted in the modification of the butter churn design (sub-project No. 32) and in the design of the condenser for aromatic oils (sub-project No. 13).

3. Conclusions.

It is unfortunate that the studies of adaptation and extension were dropped. These were a valuable part of an effective system to judge which projects and why they were especially amenable to replication. It is also unfortunate that the Chemonics' system was not adhered to.

The failure of SSAA to bring on board a sociologist or anthropologist also hurt the information management and data collection elements of the project. This person could have carried out surveys and evaluations of the applications of technologies, as well as the rates of diffusion and acceptance among farmers and other end-users. Of course, a pre-condition of the latter use of a sociologist is that there is sufficient widespread extension of technologies.

Doubtless, the sudden growth in number of new sub-projects undertaken under the new management, late in the life of the project, the fact that research and development again became

the key priorities, the fact that the last year's operations has been under a minimal budget and the fact that the sub-project activities were spread over a wide range of disciplines, locations and end user settings all contributed the lower priority given the data and information component of this project.

The continuation of AT activities is foreseen to be the responsibility of the Agricultural Mechanization Research Institute. Its appropriateness as an institution will depend on whether it can give sufficient priority and autonomy to the AT effort, whether it can make provision for equal treatment of non-mechanical solutions (some of which may have future mechanization implications) and whether it can so structure its organization that, given the autonomy requirement, AT activities can "feed" the mechanization work of the Institute. The principal concern for AT activities under the AMRI is that its primary concern is not appropriate small-scale technology, and AT activities may end up on "orphan."

IX. PURPOSE

This section measures the progress the project has made toward achieving the project purposes and allied Expected End Project Status. The stated project purposes are as follows:

- o introduce and/or adapt technologies appropriate to small farmer and rural resident needs.
- o to begin the process of developing an institutional capability in appropriate technology.
- o increase rural employment opportunities by expanding small rural based agri-business enterprises.

The expected end of project status is as follows:

- o introduced and adapted technology - items and processes in use.
- o one or more government or private agencies successfully extending appropriate technology.
- o data available on the process and institutions with interest and capability in the field.
- o small manufacturers producing project introduced machines, equipment or processes.

The statement of work requires that the evaluation team:

- o document the extent to which the project has introduced/ adapted appropriate technologies to small farmers and rural residents.
- o assess the success of the project in developing an institutional capability in appropriate technology.
- o comment on the extent to which this project has increased rural employment opportunities and expanded small rural based agri-business enterprises.
- o Comment on the contribution of the outputs in achieving the purposes.

A. Introduction of Appropriate Technology

1. Progress. To date 31 appropriate equipment items, processes and /or technologies have been introduced, most on a very limited scale.

2. Findings. The table below gives those sub-projects the output of which have started to reach the end-user. The table includes the reported number of end-users reached. These numbers were obtained from the SSAA 1982-83 Annual Report and from team member discussion with sub-project principal investigators. They represent the best estimates possible.

Table IX-1

APPROPRIATE TECHNOLOGIES INTRODUCED

Sub-Project No.	Name	Group	Reported No. of End-users Reached
1	Pheremone traps	PC	20
2(9)	Irrigation-machinery management	IFSP	255
4	Biogas generators	RD	4
5	Soluble fertilizer	IFSP	64
7	Silk production	AP	448
8	Bee-hives	AP	10
13	Medicinal herbs	PP	26
16	White cheese processing	FI	?
17	Sprinkler irrigation	IFSP	3
19	Renneting enzymes	FI	1
22	Plastic greenhouses	PP	72
26	Farm refuses as feed stuff	AP	57

Sub-Project

No.	Name	Group	Reported No. of End-users Reached
27	Algae as feed stuff	AP	4
28	Manual cotton planter	PP	20 (for testing)
31(30)	Food processing	FI	90
32	Butter churn	FI	?
33	Bananas	PP	18
36	Carrot seeds	PP	6
37	White cheese quality	FI	37
38	Milk	FI	50
39	Rabbits	AP	100+
40	Foliar fertilizer	PP	723(testing)
41	Intensive cropping	PP	306
42	Drip irrigation	IFSP	?
43	Conical shapes	IFSP	16
44	Onion seedlings	PP	37
46	Rural food industries	FI	?
48	Final leveller	IFSP	2 (for testing)
50	Rural woman's activities	RD	303
51	Small farmer activities-N.Sinai	RD	201
52	Goat production	AP	35

Key to Groups

1. IFSP = Irrigation, Fertilization and Soil Preparation
2. PP = Plant Production
3. AP = Animal Production
4. PL = Pest Control
5. RD = Rural Development
6. FI = Food Industries

There is no apparent socio-cultural evidence of end-user resistance, except in some cases of limited access for women to important market links, i.e., distribution, merchants. In fact, many of those farmers interviewed who had adopted an SSAA innovation were anxious to try out other ones. Occasionally, the adoption of one "technology" led to the adoption of another, e.g., success with long furrow cultivation led to the use of foliar fertilizer.

In sub-projects No. 50 (Development of Rural Women's Activities) for one SSAA trainee, yogurt production was so profitable that her husband took over the operation and expanded it. This switch was unfortunate in that the project target population was women. It is a reflection of the greater advantage and prerogative that a rural man has in social interaction with a wider circle of people.

3. Conclusions. The outputs of 31 of the 50 operative sub-projects have started to reach the end-users in modest numbers. While this scale of introduction in term of numbers of sub-projects addresses the first project purpose and certainly fulfills the output requirement of 10 adaptive items or systems introduced, the salient question is - how successful, or widespread, has the introduction and adoption been? A sub-assumption of the project paper was that "demonstrations of appropriate technology generate significant adoptive rates." Demonstrations alone, as the SSAA project has experienced, are not sufficient.

On the other hand, given the time and budgetary constraints

the project faced, and the change in mangement half-way through the project, the project personnel are to be commended on what they have accomplished.

B. Institutional Capability. The expected End of Project Status was to have one or more government or private agencies successfully extending appropriate technology, and to have data available on the process and institutions with interest and capability in the field.

1. Progress. The consensus of the evaluation team is that the project has been somewhat successful in developing an institutional capability to develop and deliver AT. At this point in time, its strength is in the development stage of the process. Little processed and analyzed data are available on the AT process in Egypt. Data on institutions with interest and capability are available as a result of the work and experience with many institutions over the life of the project.

2. Findings. In the development of an institutional capability to introduce AT by this project there were two broad objectives as stated in the Chemonics' quarterly reports:

> "... to provide intermittent assistance and advice on the establishment of administrative and technical functions for an institution which should serve as the basis for a permanent AT institution in Egypt."

> "... to provide operational and advisory services for establishing a new, permanent institution for the development of appropriate technology as a means of improving small farm agriculture ...."

"... to provide or develop functional, normative and diffused linkages as necessary, to ensure the development and on-going usefulness of a permanent, appropriate institution."[1]

The progress of institution building was somewhat thwarted at first by the implicit assumption (which did not completely hold) that diverse sources of expertise would eventually come together to develop an effective capacity to transfer appropriate technology. Nevertheless, despite the project's short time span and low budget, there is an attempt to integrate AT to the more widespread larger scale solutions, and working on AT for the small farmer has been largely seen as an on-going activity.

With the onset of many new sub-projects, however, institutional collaboration between the MOA and various universities, research centers and projects grew, as did a growing awareness and interest in AT. Many diverse, but relevant, AT equipment items and processes were developed/adapted. Only a very few were totally inappropriate. The extension of the developmental work has started, ranging from some extension to small, rural manufacturers to a moderate amount of extension to farmers/end-users in certain sub-projects.

Data on the process of developing/extending AT in Egypt has not yet been collected as this part of the data and information component is essentially moribund. Data on the institutions with interest and level of capability is available, but must be collected and analyzed.

3. Conclusions. First, the project has certainly benefitted

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[1]Chemonics International Consulting Division, Quarterly Progress Report No. 7, June 30, 1982 pp. 34-35.

the cause of AT by allowing Egyptian technologists an opportunity to do research and demonstrate the timeliness and usefulness of the equipment/technologies produced. The delivery, or extension to the end-user, stage needs improvement for the AMRI to be able to capitalize on the last five years of effort. Experience and information on design, applicability, replicability and to a slight degree on adoption rates have resulted. Additional effort will be required to process and analyze this information so that it will assist in the expansion of AT activities.

Other institutions, principally universities and research centers have, by working with the SSAA project, initiated capabilities in the development and delivery of AT. The ability of both the MOA and universities to coordinate and cooperate with one another, has grown and has been tested - with favorable results. At the extension level, however, there is unevenness across the various sub-projects and room for widespread improvement in the "one-on-one" extension to the end-user.

The lack of data on and analysis of the AT process in Egypt could be resolved with the help of a rural sociologist, anthropologist or farm management specialist. He/she would gain field information, analyze end-user feed back and adoption experience, and analyze sub-project success and failures. Such analysis would be the basis for more effective extension of sub-project outputs.

The evaluation team concluded that the project developed, for the first time in Egypt, an interest in AT and a nascent capability in universities, research centers, governorate extension

centers and in different departments of MOA. The future of this fledgling capability will depend on what provisions are made in its new home, AMRI, to strengthen the areas of weakness and to nurture the various areas in which the SSAA project has had success.

C. Increased Rural Employment and Expanded Small, Rural Agri-business Enterprises. The Expected End of Project Status was to have small manufacturers producing project introduced machines, equipment or processes.

1. Progress. To date, expansion of small, rural agri-business enterprises is limited, but starting to grow.

2. Findings. From the SSAA project's 1982-83 Annual Report and requests to MOA for information on the number of small manufacturers actually producing sub-project designed outputs, the team concluded that there are some 40 small manufacturers (including carpenters) in the early stages of production of SSAA outputs. Based on the Annual Report and discussions with sub-project principal investigators, approximately 330 women are actually engaged in various forms of sub-project home employment.

Part-time employment opportunities were greatest in the "Food Industries" group of sub-projects and in silk production, especially for women to work at home. The team estimated that approximately 110 women are actively engaged in various food

processing activities (sub-project Nos. 31, 50) and that approximately 220 women are involved in silk production (sub project #7), the areas which engage the greatest number of women.

The activities targetted to women, particularly those in the food processing area, were appropriate and cost-effective as activities. Participants were required to make an initial cash investment of approximately LE 5 for materials, preservatives and labels, which they were able to do and did. Thus, thev had a financial stake in the activity and an incentive to recoup their investment.

3. Conclusions. To date, the project has not increased rural employment opportunities appreciably, but the number of involved small, rural agri-business enterprises is starting to grow. It does, however, have the potential to achieve this purpose. Not withstanding the fact that certain sub-projects' innovations will displace some farm labor, most of the sub-projects offer the opportunity to increase rural employment and most of those subprojects entailing developed equipment offer the chance for small rural manufacturers to expand.

As explained in Section IV, External Factors, the small rural manufacturer needs credit to tool up, an initial order to get production underway, and linkages between him and the small farmer established. The lack of these elements in the SSAA project is one principal reason why not much progress has been made in this area. The other reason is that the pre-ponderant amount of time and funding was devoted to development work.

Some one-on-one extension for sub-project activities that increase rural employment has taken place expecially for activities carried out in the home (food processing, silk, rabbits).

The future of rural employment increase and rural manufacturing expansion related to AT will depend on (a) meeting the start-up requirements of the small manufacturer and (b) concentrated end-user extension work whereunder the farmer, the woman, the small manufacturer and the craftsman are convinced that these sub-project outputs are economically viable activities to undertake.

D. The Contribution of the Outputs

The first purpose, that of introducing and/or adapting technologies appropriate to small farmer and rural resident needs, has certainly been achieved insofar as their introduction has been made, and they were definitely necessary for introduction to take place. Of the 50 sub-projects operative at this date (a total of 54 were approved or transferred from sub-phase I in sub-phase II, of which three were not started, and one, the almanac, does not qualify as a technology introduced) the outputs of 31 have been introduced at the end-user level, are felt to be appropriate and are in varying degrees of use.

The question of sufficiency arises in connection with the training and extension outputs. The widespread adoption of the sub-project outputs will require greater extension efforts, especially those in the farmer's field, the location where the farmer becomes convinced. The examples of higher adoption rates,

such as the cases of siphon tubes, foliar fertilizer, rabbit boxes and jam/juice concentrate manufacture indicate that greater one-on-one extension efforts leads to wider spread adoption.

The purpose of beginning the process of developing an institutional capability in AT has been contributed to by the linkages that have been established with a variety of universities, research centers, selected USAID/MOA projects not directly related to AT efforts, and to a limited degree with the central extension service. The success in developing/adapting numerous equipment items, processes and technologies has well served the development of an AT institutional capability. The principal area needing improvement is that of training and extension. Extension at the end-user level was certainly necessary, but what was carried out could not be sufficient, given the time and funding constraints. Understanding that end-user level extension is required in most cases for successful introduction of an innovation, and that continued end-user level extension, coupled with the ability and wherewithal to carry it out, is required for widespread success, will help insure that a solid institutional capability in appropriate technology is built.

It should be noted that the Central Extension Service is being reorganized. Presidential Decree No. 19 of 1983 provided the basis for the development of a strong corps of extension leaders and subject matter specialists. The decree mandated that a significant portion of current research personnel reorient their efforts toward extension. Recommendations to the GOE of the International Agricultural Development Service (in cooperation

with USAID and the World Bank) report, "Increasing Egyptian Agricultural Productivity through Strengthening Research and Extension Programs" included:

1. A level of training equal to research personnel.
2. Training and skill upgrading for current personnel prior to more hiring.
3. Adequate transportation and availability of funds for extension agent operating expenses.
4. Incentives to supplement base salaries.

The final purpose - that of increasing rural employment opportunities by expanding small rural based agri-business enterprises - was largely not achieved. Appropriate training and extension efforts for this audience was definitely necessary. Unfortunately, it was assumed in the project design that once an innovative piece of equipment was designed and then demonstrated, demand would occur naturally and the small rural manufacturer would act accordingly, i.e., sense the demand and start production. The experience of the Small Farmer Production project with small manufacturer credit needs, initial orders and farmer-manufacturer linkages did not bear out this assumption. Effort has been made to get the small manufacturer involved, but the flawed assumption has limited the degree of involvement possible.

X. GOAL

This section describes the progress made toward achieving the overall project goal, namely:

- An improved quality of life for rural families and the increased participation by small manufacturers in national economic development.

The statement of work requires that the evaluation team:

- Assess the extent to which the project has affected (a) the quality of life of rural families in Egypt and (b) the participation of small entrepreneurs in national development.

A. Quality of Life. The improvement in quality of life for rural families (as a result of SSAA activities) can not be measured quantitatively not only because no socio-economic base line survey of rural families to benefit (in the project area) was made at the beginning of the project, but also because, due to the relatively short time the current project management has had to carry out the project, there has not been widespread adoption significant enough to have affected the quality of life for large number of rural families in a measurable way. The potential, however, of the project to affect the quality of life of Egyptian rural families is very real in both the near and long terms.

The "income generating" sub-projects (e.g. silk production, food processing in the home, the dairy product sub-projects, bee hives, rabbit raising) have the greatest potential in the near term[1] because it does not, as SSAA has experienced, take as much time to extend these activities to the end user and

[1]As do the North and South Sinai and the development of rural women activities sub-projects to the extent that they incorporate the "income generating" sub-projects.

results are attained faster than in the more agriculturally -oriented sub-projects which are longer term by their very nature. This does not mean that the agriculturally oriented projects have any less potential, in fact, their "audience" is much larger (farmers) and with widespread adoption, the benefits to rural families in the aggregate would be greater than the "income generating" sub-projects.

Finally, there are other improvements in the quality of life resulting from various sub-projects, namely increased literacy and knowledge of nutrition in the rural development group of sub-projects, time savings and reduction in laborious field work, and the wider availability and higher quality of certain food products.

B. The Small Entrepreneur. Progress toward increasing the participation of the small entrepreneur in national development has been relatively slow given the short time the project has had to develop this area the fact that, in the project design, it was incorrectly assumed that the small manufacturer would need minimal outside assistance[2] and it appeared that the designers expected that small manufacturer interest to produce SSAA generated equipment would arise once they knew that farmers wanted the equipment. This did not happen, as was stated earlier in the discussion of the Small Farmer Production project in Section IV, External Factors.

The SFP project because of its credit component and extension

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[2]Project Paper, p. 7.

to the small manufacturer, and the AMP project because of its linkages to village workshops have started to become important factors in helping SSAA make progress toward the small entrepreneur goal. This is happening as equipment/processes are adopted by these two other projects and extended to end-users.

C. Other Beneficiaries. The SSAA project also includes farm laborers, women, counterpart agency personnel, and indirectly, rural residents and consumers. The benefits accrued to these groups as well as to farmers and small rural manufacturers is presented in Section XI, Beneficiaries.

XI. BENEFICIARIES

This section identifies the direct and indirect beneficiaries of the project. In the project paper, it was deemed that the Development Assistance Project Criteria were not applicable, however, this section gives the criteria expressed in Section 102 (b) of the FAA. It also states how many[1] direct beneficiaries benefitted and how both direct and indirect beneficiaries benefitted.

Criteria

No.	Description
1	Involvement of the poor in development
1a	- by extending access to the economy at the local level.
1b	- by increasing labor intensive production and the use of AT.
1c	- by spreading investment out from cities to small towns and rural areas.
2	Reduce rates of unemployment and under-employment.
3	Support the self-help efforts of developing countries.
4	Promote the participation of women in the national economies of developing coutries and the improvement of the status of women.

[1]As best can be determined from the project's only annual report which is one year old and its data which is not clear at times, and which for some sub-projects is incomplete and/or not reported by the MOA extension service.

A. Direct Beneficiaries

1. Small farmers and farm laborers. Applicable Criteria: 1a - 1c, 2, 3. The small farmer is, of course, the ultimate target of this project, both as end user and as the market for the small, rural manufacturer. Approximately 1700 had benefitted as of June 1983. The benefits that have accrued to the farmer of course depend on the nature of the sub-project. The sub-projects which are targetted to the farmer/livestock raise address the constraints inherent in Egyptian agriculture, i.e. a limited amount of new land that can be opened under traditional means and limited opportunities to expand livestock herds. In general, the benefits which the farmer has gained have centered on increased production, productivity and income, as well as decreased labor costs, risk and time spent on laborious agricultural tasks. He has gained in knowledge and experience, and with the spread of AT, will be better prepared to assimilate the more sophisticated technologies available to the larger farmer. The laborer gains from his own increase of productivity and from the decreased amount of laborious work. Some other farmers benefit to the extent that they are the sources of supply of fresh fruit, vegetables and milk for the various food processing sub-projects.

2. Small Manufacturers and Employees. Applicable criteria: 1c, 2. The extension of project developed equipment to small rural manufacturers has started, but the results have been limited. Approximately 40 small manufacturers and 80-120 employees have benefitted. The benefits which accrue to this

group of beneficiaries are an expanded market for their products/ services and a stronger linkage to the agricultural sector. These in turn mean increased incomes for the owners and employees, stimulate increased employment opportunities in this sector and generally increase knowledge and experience.

Because of the constraints faced by smaller rural manufacturers (lack of credit, linkages to farmers, and inability to produce certain items), some larger manufacturers benefitted from selected sub-projects, i.e., those entailing long furrow agriculture (siphon tubes) and sprinkler irrigation systems.

3. Counterpart Agency Personnel. Applicable criterion - 3. Approximately 210 benefitted. This group of direct beneficiaries gained in knowledge and in professional development. The design and implementation of the project also served to increase their understanding of the critical need for strong linkages between agricultural research, education, extension and the farmer.

4. Women. Applicable criteria: 1a-1c, 2, 4. Approximately 650 women have benefitted. Certain sub-projects, notably in the food processing area (production of jams, juice concentrates, pickled vegetables), silk production, and integrated rural development were aimed largely or partly at women. Thus, the number of economic activities open to women has increased, literacy (the integrated rural development sub-projects) training has benefitted some women, and their incomes have increased. To the extent they have been able to substitute home activities for work in the fields, they have reduced the amount of laborious

work they must do, and they have fulfilled, at least partially, a cultural preference that women engage in home-oriented activities.

B. Indirect Beneficiaries

1. Rural Residents and Consumers. Depending on the progress of the particular sub-project, this group has started to benefit indirectly, but importantly, from greater food production, more timely and wider availability of food products, higher quality products, and for certain products which are starting to reach neighborhood markets (notably jams, juice concentrates and pickled vegetables), lower prices. Also, production for home consumption has started to increase in the dairy product area.

2. Egyptian Agriculture. This project has laid the ground work for the institutionalization of AT in Egypt. Certain sub-projects have had a fair degree of success and are starting to spread in terms of end-users. The SSAA activity, after the PACD, will become part of the MOA's Agricultural Mechanization Research Institute. SSAA has benefitted Egyptian agriculture by filling a gap between traditional agriculture and the fairly sophisticated agricultural techniques and equipment being introduced.

XII. UNPLANNED EFFECTS

The Small Scale Agricultural Activities Project has had certain unexpected results not foreseen on the Project Paper in the areas of economic situations, health and social structures. It has also had some miscellaneous, but important, impacts.

A. Economic/Technical

1. It was probably not expected that the Small Farmer Production project would adopt and extend equipment/processes developed under the SSAA to the extent that it has. Moreover, SFP has underlined the need for hands-on extension work to be done vis-a-vis the small rural manufacturers in building manufacturer-farmer linkages, and the need for credit and demand "pump-priming." The participation of SFP has been completely advantageous, complementing the limited hands-on extension activities of SSAA with both farmers and small manufacturers.

2. The change in focus of the SSAA project resulting from the change in MOA project administration and the need to get activities under way launched many new sub-projects. The lack of time and personnel meant that these numerous sub-projects could not be brought to completion as project management wanted. Certain sub-projects, however, the rabbit boxes, application of foliar fertilizer,[1] conventional services for banana farms and local processing of foodstuffs, were "naturals" - and with

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[1]Foliar fertilizer is a sub-project which has been mentioned several times as being relatively successful and one with high potential. While it certainly is of interest to farmers, the evaluation team found no evidence of widespread, complete substitution of soluble fertilizer for granular fertilizer.

more extension and close monitoring could be very successful.

3. Some larger manufacturers have benefitted from the project, e.g., manufacturers of siphon tubes and plastic piping for long furrow irrigation and sprinkler irrigation equipment. This has been beneficial in that it has made available the equipment for the sub-project to progress, but the use of larger manufacturer was not an objective of the project.

4. An unplanned health effect of the food processing activities (see below) has emphasized the need for improved product quality - not only for local market but also for the larger urban and export markets. Part of the quality question is that of product cleanliness - especially for export markets. European markets have extremely stringent requirements for the fresh produce that will be admitted - both in terms of quality and sanitation. Sub-project No. 43, Conical Soil Shapes, while intended to increase the effective amount of area the very small farmer could cultivate for certain crops, had the unplanned effect of being a method to produce vegetables and strawberries which are relatively free from dirt - one factor which in the past has blocked Egyptian exports of these products.

5. Plastic green house cultivation, if it spreads should have positive effects for the consumer in the provision of out-of-season food items. It could also help the farmer stagger his production to take advantage of times of year when certain crops aren't widely available and prices are favorable.

B. Health

1. The milk and milk products sub-projects have improved the hygienic quality of these products.

2. From all of the food processing activities, the need for improved sanitation in processing was quickly evident both for health and marketing reasons.

3. Labor saving devices on the farm, especially those that reduce the need to use the lower limbs, are in demand because of the prevalence of bilharzia among rural farm families along the Nile and in the Delta. This factor has also helped weed out those manual operated equipment items which require leg power.

4. A future advantageous impact will be in the area of nutrition. With the growth of certain food processing activities, animal and plant production activities, greater availability of milk and milk products, meat, and fresh produce out-of-season will have some positive effect on consuming populations.

C. Social

1. The spread of labor saving equipment and processes has both advantages and disadvantages. Its advantages are positive income effects for the farmer and his family, for women who are freed up to pursue other income-generating activities, and in the reduction of laborious field tasks. The negative side is that labor saving equipment tends to displace rural labor and hastens their exodus to urban areas - putting greater pressure on already inadequate housing and urban services, and adding

to the amount of unemployment and underemployment.[2]

2. Small farmers and sharecroppers may take up "block-farming," creating aggregate larger farms in order to take advantage of the benefits of SSAA generated innovations.

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[2]The SSAA project management is aware of this effect and attempts to design equipment to help overcome peak period shortages of labor.

XIII. LESSONS LEARNED

This section sets forth the lessons, both positive and negative, which have been learned not only in the project, but also in the final evaluation itself. It addresses those elements that AID should consider replicating in future AT projects, those elements that should be avoided, and makes a general recommendation for follow-on activities.

A. The Principal Lessons Learned.

1. Appropriate technology is much more than just low-intermediate stage mechanization on the farm. It cuts across economic activity areas (farm, household, manufacturing, servicing), technical activity areas (equipment, processes, technical packages), and entails various levels of sophistication (from raising rabbits in boxes to use of pheremone traps).

2. The AT process (problem identification to widespread application of solutions) takes longer than three or five years. Attempting to establish a "bottom-up" approach to institutionalization in a country where institutionalization is traditionally a "top-down" activity requires a long time.[1]

3. An effective approach to identifying potentially successful activities is an empirical one which correctly identifies real needs, and activities of lower risk, and a higher probability of success. This approach would also allow an AT project to

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[1]The experience of USAID/RABAT and the University of Minnesota assistance to the Agricultural University INAV Hassan II is a good case in point. It has taken 10 years, and a great deal of cooperation to alter this institution into one which fits into and fulfills the requirements of strong University - Research Center - Extension Service - Farmer linkage.

introduce its highest potential (short-term) outputs first, thus insuring a higher level of end-user interest, not only in the initial offerings, but also in those to come. Many AT adopting end-users commented to the evaluation team that they were interested in learning about other SSAA outputs which they could use.

4. The end-user is absolutely key in the AT process - from problem identification to widespread extension and application of the developed solution.

5. A base-line study (socio-economic) at the beginning of the project is essential and that socio-cultural expertise in the field throughout the life of the project is critical to its success.

6. The expansion of the project's focus, from one that was principally mechanization to one which included more diverse activities - processes, animal and plant production, pest control, women/families and an assortment of income generating activities was valid. In the opinion of the evaluation team the new activities which were undertaken should have been empirically selected for the greatest chances of success.

7. Reliance on the "demonstration effect" of showing farmers new machinery and processes (whether at an exhibition or on television) to create demand for AT does not by itself succeed. It is rare that such demand will come about "naturally." Farmers have to be convinced, often repeatedly, in their own fields. On the other hand, a medium such as television can spur interest, as was evidenced by the television show on using

farm refuses as animal feed (sub-project No. 26). Reportedly, this show generated close to 10,000 letters of interest on the part of farmers.

8. Small, rural manufacturers are unlikely to start producing equipment for farmers as a result of having been exposed to a prototype piece of equipment. Credit, farm-manufacturer linkages and an initial guaranteed market are needed.

9. The use of part time researchers/professors in AT activities means the ability to tap a wide base of knowledge and creativity. On the other hand the part time person's duties and interests are divided, and often he can not devote the requisite amount of time to the project.

B. What USAID Should Consider Replicating

1. Involvement of academic, government and research institution personnel in the entire AT development process, especially on the "field" level-in order to promote the understanding that the whole process of problem identification-solution is a "bottom-up" process-starting in the farmer's field.

2. Adherence to an identification to solution process such as advocated by Chemonics.[2]

3. Where possible, link sub-projects together to get "synergistic" effects, e.g., long furrow cultivation coupled with the use of the leveller and fertilizer in solution added to irrigation water.

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[2]Chemonics International Consulting Division, "Final Report For the Small Scale Agricultural Activities Project," Washington, D.C., April 29, 1983, p. 13.

4. An organizational framework that uses a "follow-up" committee is an effective way of encouraging part-time staff to produce results.

5. Actively linking up with allied projects, such has happened with the Small Farmer Production Project.

6. The implementation of short term third-country training. Failure to complete the training envisaged in the SSAA project meant that most of the current management personnel of SSAA have not gained first-hand knowledge AT in other countries. Third-country training can be an effective incentive for better understanding appropriate technologies and for greater output from a project's professional staff.

C. <u>What USAID Should Consider Avoiding</u>

1. A project time frame that is too short to accomplish what is desired.

2. The lack of socio-anthropological expertise from the problem identification stage through completion of a sub-project.

3. The start-up of many activities without rigorous empirical analysis being made to make certain they have a good chance of success.

4. The lack of a base-line study to be able to monitor the progress of the various sub-projects, to be able to measure the degree of success achieved, and the ability to gain feed back from end-users to be able to make necessary decisions/changes during the project implementation stage and for potential follow-on activities.

5. The lack of a needs assessment of the end-users.

6. The omission of socio-cultural expertise (relevant to No. 4 above). Such expertise would have provided an early needs assessment and therefrom a strategy for sub-project development which would have answered farmers' needs in their contexts of risk avoidance, and operation under a mixed system of price, acreage and input controls and subsidies and the free market.

7. A project design which assumes that small farmers and small manufacturers, once exposed to an innovation, will at once see its benefits and adopt/manufacture it. This is belied by the SFP project-determined need for credit for even moderately expensive innovations in the end-users' and small manufacturers' terms, and the need for small manufacturer-small farmer linkages (information, spare parts, maintenance) to be established. "Immediate" adoption occurs sometimes if the innovation is inexpensive enough and the benefits obvious enough (e.g., rabbit boxes, foliar fertilizer application).

D. Follow-on

The evaluation team understands that the activities of the project at its PACD will be assumed under the aegis of the recently established Agricultural Mechanization Research

Institute.[3] Therefore, our recommendations for follow-on activities are offered within this context.

1. Since some of the activities of the SSAA project had little to do with agricultural mechanization, but showed potential to be successful, some on a wide scale, the organizational structure of the AMRI should be so designed and its institutional direction be so defined as to:

a. encourage both mechanical and non-mechanical aspects of AT. Certain non-mechanical sub-projects of the SSAA project have potential mechanization implications, e.g., sub-project No. 41, Intensive Cropping Techniques. The future of this sub-project, as seen by the plant production specialist is in a shift from inter cropping to sequenced cropping in rows. Row agriculture implies mechanization.

b. insure AT activities the appropriate degree of autonomy to maintain the high level of creativity and breadth of response experienced by the SSAA project.

c. be given the opportunity to carry out (where applicable) AT developmental work which ties into mechanization development.

d. be able to establish explicit linkages with the Small Farmer Production project to maintain and expand the current

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[3]According to SSAA project management, the SSAA activities will remain under AMRI (with MOA funding) until the MOA Central Extension Service completes its reorganization (one-two years) at which time, technical AT activities will be carried out by the appropriate MOA research institutes (e.g., AT in mechanization, AMRI, AT in plant production under the horticulture or vegetable research institute, etc.) and extension activities for AT will be taken over by the Central Extension Service.

relationship between the two projects.

e. be able to further linkages with AMP so that AMP, through its village workshops component, can complement the SSAA project's extension of AT activities to small, rural workshops.

2. Based on the services of a socio-cultural expert, a careful review of the SSAA sub-projects should take place to determine those current activities which have the highest chance of success, those which have potential but need further development, and those which are highly questionable and should be dropped.

3. The current focus of the SSAA project, i.e., on income-generating activities across a spectrum of agricultural and agriculturally-related areas should be maintained. In fact, the focus could be made more precise by concentrating on income-generating activities along the "food chain". The use of this construct entails looking from the consumer back to the farmer. It allows all aspects of food to be examined-from production to nutrition, and includes some of the main constraints which face the farmer and the consumer, i.e. an inefficient, fragmented distribution and marketing system in Egypt.

One of the early sub-projects of SSAA addressed a distribution problem - with the development of more appropriate vegetable packing boxes to reduce the loss of vegetables in transit from the farmer to market. Since that sub-project, there has been little, if any, focus on the problems inherent in Egyptian distribution and marketing of food products. Many complaints voiced

by farmers to the evaluation team centered around the inefficiencies and related problems of the distribution/marketing part of the food chain. One farmer, involved in sub-project No.13, Production of Medicinal Herbs and Distillation of Aromatic Oils, stated that he often loses up to 50% of his fresh herb production because of lack of timely transportation to market. Appropriate technology does not stop at the farm gate.

APPENDIX 1

LOGICAL FRAMEWORK

Goal:

Improved quality of life for small farmer and other rural families and increased small entrepreneur participation in national economic development.

Measures:

1. Increase in disposable income of small-farmer and off-farm rural families.

2. Improvement in the quantity of farm products delivered to local consumers and for export.

3. Improved working conditions for rural residents.

Means of Verification:

1. Official reports of the Ministry of Agriculture.

2. Comparative reviews of socio-economic impact of project.

Assumptions:

1. A relationship exists between higher production and living conditions and the quality of life.

2. Inflation and price policies encourage farmers to produce more and this higher production raises their income.

Project Purpose:

1. Introduce and/or adapt technologies appropriate to small farmer and rural resident needs.

2. To begin the process of developing an institutional capability in appropriate technology.

3. Increase rural employment opportunities by expanding small rural-based agri-business enterprises.

End of Project Status:

1. Introduced and adapted technology items and processes in use.

2. One or more government or private agencies successfully

extending appropriate technology.

3. Data available on the process and institutions with interest and capability in the field.

4. Small manufacturers producing project introduced machines, equipment or processes.

Means of Verification:

1. Ministry of Agriculture Reports.

2. Internal reviews of the project.

Assumptions for Achieving Purposes:

1. Demonstrations of adaptive technology generate significant adoption rates.

2. Small-scale manufacturers are able to finance and carry out production in response to demand for new items.

Outputs:

1. Items or processes of appropriate technology in use in rural areas.

2. Counterpart and cooperating agency personnel trained and in place.

3. Training and extension programs.

4. Instructional materials prepared.

5. Data and information on process of appropriate technology development and extension in Egypt.

Magnitude of Outputs:

1. Ten adaptive equipment items or systems introduced.

2. 100 persons from counterpart agencies trained in applications of appropriate technology to local farm problems.

3. 5000 farmers and 20 local manufacturers received training.

4. Demonstration programs carried out for each equipment, machine or process introduced..

5. Instructional materials in Arabic prepared for each equipment item.

6. Three studies available on process of adaptation and extension of appropriate technology.

Means of Verification:

1. Counterpart agency and Mission reports.
2. Project reviews--internal and external.

Assumptions for Achieving Outputs:

1. Appropriate technology equipment and processes exist that can be adapted to meet local problems.

2. Suitable personnel available for training.

3. Effective training and extension programs for funding can be developed.

Inputs:

1. Technical Assistance.

2. Training.

3. Commodities.

4. Local costs in L.E.

5. ARE staff, facilities, operating costs and services.

Implementation Targets (excluding inflation and contingency):

1. One direct-hire officer and one 2-year contract staff member to take lead roles in introducing the technologies and to supervise short-term consultants' work (18 person months) on specific problems.

2. Funds for training of U.S. $100,000.

3. Commodities, for support of appropriate technology unit and developing prototypes, totaling U.S. $68,000 (LE and $'s)

4. LE financing for development of equipment prototypes and demonstrations and for project administrative costs totaling U.S. $700,000.

5. ARE inputs valued at $360,000.

Means of Verification:

1. Project progress reports.

Assumptions for Providing Inputs:

1. Project inputs provided according to schedule.
2. GOE support for project continues at necessary levels.

APPENDIX 2

SCOPE OF WORK

ARTICLE I - TITLE

Small Scale Agricultural Activities Project (SSAA) (Project no. 3-0096).

ARTICLE II - OBJECTIVE

The objective of this work order is to evaluate the above project and to identify areas and topics of particular interest and importance to the longer range interests of the project.

ARTICLE III - STATEMENT OF WORK

The Contractor shall be responsible for the following:

1. Assess achievements at the output level:

a. Document the activities ("prototype solutions") developed under this project. (What has been the distribution of activities across the range of priority needs for appropriate technology in Egyptian agriculture?) Comment on their appropriateness, replicability, cost-effectiveness and adoption by farmers or entrepreneurs to date. (Are they appropriate and adequate to address the priority needs of Egyptian agriculture? Can they be replicated at reasonable cost? Are they being adopted and used appropriately? To what effect?)

b. Document the extent and nature of training under this project. Comment on the value and utility of this training. (Has training produced discernable improvements in the abilities of participating agencies to identify and develop appropriate technologies for Egypt? In what ways? How widespread are any improvements?)

c. Assess the effects of training and extension directed to local equipment manufacturers and small farmers using the equipment. Include an assessment of the instructional materials to have been developed. (How effective have training, extension and instructional materials been? Have their skills been utilized by manufacturers or farmers after training?)

d. Assess the data and information component of the project. (Has an effective system been developed to judge those items and methods most amenable to productive widespread replication? Have appropriate institutions been identified through which appropriate technology activities could be continued?)

5. Comment on the funding and staffing provided to achieve the outputs. (have they been at the planned levels? Were the levels adequate? Were they distributed and used in a way appropriate and sufficient to allow output achievement?)

2. Assess achievements at the purpose level:

a. Document the extent to which this project has introduced/ adapted appropriate technologies to small farmers and rural residents.

b. Assess the success of this project in developing an institutional capability in appropriate technology.

c. Comment on the extent to which this project has increased rural employment opportunities and expanded small rural-based agribusiness enterprises.

d. Comment on the contribution of the outputs in achieving the purposes. (Were they necessary? Sufficient?)

3. Assess the extent to which this project has had an effect on:

(a) the quality of life of rural families in Egypt, and

(b) the participation of small entrepreneurs in national development. Note other project beneficiaries, if any.

4. If and where appropriate and possible, consider the external (non-project) factors that may have affected the progress and impact of this project. (For example, is appropriate technology being promoted through other channels besides this project? Are there economic factors encouraging/discouraging local entrepreneurs to enter appropriate technology manufacturing?)

5. Document the lessons that can be learned from this project's experience and results. (What, if anything, should AID replicate from this project's experience? What, if anything, should be avoided.

In conjunction with their evaluation data gathering and analysis, the team will be required to present three seminars on agricultural related appropriate technology topics related to on-going small scale, income generating project activities. A number of topics relevant to the on-going project will be provided to each member of the team from which seminar topics should be chosen in coordination and consultation with MOA officials upon arrival of the team in Egypt.

These seminars thus will serve to present new information and/or new perspectives on existing information to Egyptian

project participants while simultaneously permitting the evaluation team to gather project information and assess project progress based on their judgement of participants' understanding of the project's activities to date. It should be remembered that these topics should be adaptable to the Egyptian environment and from which a number of recommendations can be implemented once AID project funding has been completed.

Basic methodology for all USAID/Cairo evaluations relies predominantly on informal interviews and site visits by the team. Interviews will be primarily with Ministry of Agriculture staff, Egyptian Project Chief Investigators, USAID staff involved in project implementation and project beneficiaries in selected rural areas of Egypt. These interviews are to be qualitative in nature (i.e., statistics are not compiled) and are to be used in combination with the first hand observations of the project's activities in the team's preparation of its evaluation report. In other words, USAID/Cairo expects the team to rely on its expertise and experience to analyze and convey an overall sense of the project's progress and impact based on what it sees and hears in a relatively short and constrained time frame.

ARTICLE IV - REPORTS

The Contractor shall submit outlines of the seminars presented and a final report of the evaluation prior to leaving Egypt.

ARTICLE V - RELATIONSHIPS AND RESPONSIBILITIES

Technical guidance will be provided to the Contractor by the USAID/Cairo Agriculture Office and the Ministry of Agriculture.

ARTICLE VI - TERM OF PERFORMANCE

The effective date of this work order is May 7, 1984 and the estimated completion date is July 31, 1984.

Subject to the written approval of the Project Manager (see blocks on the Cover Page), the estimated completion date of this work order may be extended provided that such extension does not cause the elapsed time for completion of the work, including furnishing of all deliverables, to extend beyond 30 calendar days from the original estimated completion date. The contractor shall attach a copy of the Project Manager's approval for any extension of the term of this order to the final voucher submitted for payment.

APPENDIX 3A

EVALUATION TEAM SCHEDULE AND ITINERARY

May 10, 1984	Team specialists arrive
May 12-13	Conference on Appropriate Technologies for Egyptian Agriculture at the Egyptian International Center for Agriculture. Team Leader arrives.
May 14	Briefing at USAID; review of documents.
May 15	Briefing with project coordinator (MOA); work plan preparation.
May 16	Review of documents.
May 17	Field trip to Ain Shams University and Kalyoubia/Moshtuhor area.
May 19	Field trip to El-Mansoura area.
May 20-22	Field trip to Ismailia and North Sinai (El-Arish area).
May 23	Field trip to Giza area.
May 24	Field trip to Menoufiya area.
May 25	Field trip to El-Fayoum.
May 26-27	Field trip to El-Minya/Mallawi.
May 28-31	Series of five workshops held on principal project areas; interviews of sub-project investigators, meeting with SSAA technical committee, report preparation.
June 1-19	Report preparation.
June 3-13	Seminars given to project participants; interviewing of sub-project principal investigators continues; interviews with other organizations linked to project.
June 14	Draft final report to MOA and USAID.
June 17	Briefing of MOA on conclusions and recommendations.
June 18	Comments on draft final report received by team from MOA and USAID.

June 18-19	Comments reviewed and incorporated into draft final report.
June 20	Team departs (with exception of team leader).
June 20-23	Team leader finalizes evaluation report; delivers final report to MOA and USAID.
June 24	Team leader departs.
June 26-30	10 copies of final report printed, bound and shipped to Mission.

APPENDIX 3B

AGENCIES AND KEY INDIVIDUALS INTERVIEWED

Ministry of Agriculture

Dr. Ahmed F. El-Sahrigi, Director of the SSAA Project and Director of the Agricultural Mechanization Research Institute
Dr. Mounir A. Morcos, SSAA Project Coordinator and Chairman of the Agricultural Engineering Department of Cairo University
Dr. Ahmed Mamdouh El-Baz, SSAA Project Extension Advisor
Mr. Mohamed F. Bahgat, Project Administrative Coordinator
Dr. Hosny Khalifa, Horticulture Research Institute
Dr. Shaker S. Rizk, Horticulture Research Institute
Dr. Fawkia El-Kotbi, Plant Protection Institute
Dr. El-Saadany, Animal Production Institute
Dr. Mamdouh Riad, Horticulture Research Institute
Dr. Mohamed El-Gammal, Agriculture Research Center
Eng. Makram Kromer Giris, Mallawi Agriculture Center
Dr. Abdel Salam A. Gomaa, Agriculture Research Center

Ministry of Industry

Eng. Nabil Hanna

Ain Shams University

Dr. H.F. Haggag
Dr. Mohamed Nabil El-Magdoub
Dr. Abd El-Aziz Sheta
Dr. Ahmed El-Araby
Dr. Mohamed Ali El-Bambey
Dr. Rashad El-Mahdi

Assiut University

Dr. Mostafa K. Imam

Cairo University

Mr. Mahmoud K.E. Ibrahim, Vice Dean
Dr. Taha El-Bedawi
Dr. El-Sherbini Abdel Rahman Abdel Hassan
Dr. El-Saady Badawy
Dr. Taha El-Gallad
Dr. Kamal A. El-Fadaly
Dr. El-Sayed Jehad
Dr. George Bassily Hanna

El-Azhar University

Dr. Maher Amin Wally
Dr. Aly Morsi Saleh

Fayoum University

Mr. Hamdy Salem El-Sayed

Helwan University

Dr. Nazima Abdel Ghaffour Bastawi

Mansoura University

Dr. Saud A. Hamad
Dr. Mohamed El-Shennawi

Moshtuhor University

Dr. Mohammed Y. El-Ansary
Dr. Ahmed Hassan Dawood

Zagazig University

Dr. Dyaa Abdou

Rice Research and Training Project

Mr. M.S. Balal

Agricultural Mechanization Project USAID/MOA

Dr. David W. Gaiser, Jr., Team Leader and Project Technical Director
Dr. Ahmed El-Beheiry
Dr. Fred Schantz

Major Cereals Improvement Project USAID/MOA

Dr. Kenneth G. Carsman

Small Farmer Production Project USAID/MOA

Dr. Mahmoud Nour, Project Director

National Center for Education Research

Dr. Mohamed Awad El-Batawi

Catholic Relief Services

Mr. Mark Lange
Mr. Ahmed Bahgat
Mr. Andrew J. Koval - Director Middle East
Mr. Roy Porfiri
Ms. Maggie Awadalla

Food and Agriculture Organization

Dr. Mahmoud Abdourezek

USAID/CAIRO

Mr. Jeffrey R. Lee, Project Officer
Mr. Arnold Radi, Office Director, Agriculture

APPENDIX 3C

PRINCIPAL INSTITUTIONS COOPERATING WITH THE SSAA PROJECT

Government

Ministry of Agriculture including:

- Agriculture Research Center
- Agriculture Research Station - Domyetta
- Central Extension Service
- Horticulture Research Institute
- Mallawi Agriculture Center
- National Research Center
- Nubaria Research Center
- Plant Protection Institute
- Vegetable Research Center

Ministry of Industry:

- Center for Industrial and Engineering Design Development

Ministry of Supply:

MOA/USAID:

- Agricultural Mechanization Project
- Small Farmer Production Project
- Rice Research Project

National Center for Educational Research

Universities

- Ain Shams University
- Assiut University
- Cairo University
- El-Azhar University
- Fayoum University
- Helwan University
- Mansoura University
- Moshtuhor University
- Zagazig University

Other

- Catholic Relief Services
- Family Planning Organization
- Food and Agriculture Organization
- Misr, Inc. (Research Laboratory)

APPENDIX 3D

MEMORANDUM OF DISCUSSION

On June 17, 1984, the evaluation team met with the SSAA Project Director and Coordinator to discuss the evaluation which had been completed. The findings, conclusions and recommendations were covered in detail, findings and recommendations were further refined, and differences in conclusions were reconciled. The evaluation team appreciated the opportunity to discuss the work and felt that this meeting was very helpful to the evaluation and to the future course that AT activities will take in Egypt.

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APPENDIX 4

SEMINAR OUTLINES

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Joseph K. Campbell

June 3, 1984

THE IMPORTANCE OF MANUFACTURING AND DISTRIBUTION WHEN DESIGNING AGRICULTURAL EQUIPMENT

1. The Challenge of Designing Agricultural Machinery
2. How Can a Design Fail?
   a. Function
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Joseph K. Campbell

June 6, 1984

THE ADVANTAGES OF WORKING WITH MANUFACTURERS WHEN DESIGNING MACHINES AND BUILDING PROTOTYPES

1. Agricultural Implement Design as Affected by the Availability of Tools, Processes, and Materials in the Manufactory
    a. example of a land leveller
    b. example of a planter
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2. The Design of a Machine as Affected by the Degree to which a Shop can Meet Dimensional Tolerances
    a. allowing for tolerance "build-up"
    b. example of clamp for greenhouse frame
    c. example of fertilizer applicator to irrigation water
3. The Need for the Design Engineer to Spend Time with the Shop Owner when Building the Prototypes
    a. lessons learned at IRRI
    b. artisans are specialists

Joseph K. Campbell

June 10, 1984

TRANSPORTATION ON THE FARM

1. Power Units
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3. Human or Animal-powered Wheeled Vehicles
   a. wheel barrow
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4. Wheels
   a. importance of diameter
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El-Kheir Khalafalla

June 5, 1984

THE INTEGRATED APPROACH FOR THE USE OF ORGANIC WASTE

1. Importance of Reusing Organic Waste
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   e. fertilizer
3. How to Select the Appropriate Use
   a. social acceptance
   b. availability of wastes - quantity, quality
   c. health considerations - appropriateness of the indirect method
   d. the biogas model at El-Arish - why it is not in use
4. The Integrated Approach
   a. advantages - resource utilization, yield, rationality
   b. algae - a source of poultry and fish feed, sub-project No. 27
   c. animal manure as an indirect feed source for fish
   d. advantages of daily application
   e. raising ducks; poultry/rabbits in confinement
   f. subsoil drainage for field irrigation/fertilization

El-Kheir Khalafalla

June 9, 1984

UTILIZATION OF HERBACEOUS FORAGE TO SUPPORT RUMINANTS IN RURAL AREAS

1. Animal feed supply as a crucial factor in livestock development
2. Present livestock numbers in relation to local feed supply
3. Present forage supply situation
4. The disadvantages of the prevailing forage supply system
5. Available options:
   a. develop a system based on herbaceous forage
   b. destocking measures to bring the animal population within country's carrying capacity
   c. maintain present herd size and continue forage import
6. Disadvantages of the last two options
7. Means to realize the first option:
   a. forage crop - increased productivity and new varieties
   b. conservation - upgrading
   c. storage - upgrading
   d. agricultural by-products - upgrading
8. How SSAA approached these issues:
   a. sub-project No. 26
   b. the offered solution: practicability and feasibility
   c. constraints
   d. measures to overcome the constraints

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9. Forage conservation

   a. silage trials in North Sinai

   b. reasons for the failure

      i. appropriateness of the approach
      ii. cost effectiveness
      iii. the risks involved

10. Recommendations

   a. greater effort on drying methods and storage

   b. extension system reexamined

   c. emphasis on non-traditional animal feeds

El-Kheir Khalafalla

June 12, 1984

ANIMAL PRODUCTION ACTIVITIES AT THE SMALL FARMER LEVEL

1. The backyard system: its dependence on household resources
2. The small farmer - the major supplier of livestock products
3. Constraints on the development of selected animals in rural areas:
   a. water buffalo
   b. goats
   c. poultry
   d. rabbits
4. SSAA contribution toward overcoming the constraints:
   a. raising rabbits in boxes - a specialized solution
   b. small-scale chick brooder and egg incubator - an expensive solution
   c. technological methods in goat raising - an unlikely solution
5. Recommendations
   a. improving small farmer activity
   b. more adaptive research
   c. the extension delivery system

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William J. Russell

June 5, 1984

FARMING SYSTEMS RESEARCH DEVELOPMENT

1. Purpose of the Seminar
2. Research in Small Farm Development
   a. experiment station focus
   b. farmer focus
3. Indicators of Small Farm Development
   a. increased income
   b. amount of cash input
   c. farmer and entrepreneur participation in credit programs
   d. farmer and entrepreneur participation in the development project
   e. effect on commercialization
   f. improved farm family well-being
   g. more productive use of limited farm resources
   h. increase in labor productivity
   i. increase in quality or quantity of food and fiber of a farmer
4. Definition of Farming Systems and its Meaning
5. Farming Systems Development Method
   a. identification of significant interactions
      i. people with people
      ii. plants with animals
      iii. plants with plants
      iv. plants with soils

6. Steps in a Farmer-Scientist Collaborative Farming Systems Approach

a. site description

b. selection of areas where farming systems research is to be developed

c. the farm survey

d. careful selection of participating farmers

e. farmer as part of the research team

7. Steps to Develop Relevant Appropriate Technology in the Farming Systems Research

a. description stage

b. testing stage

c. extension stage

8. Development of an Appropriate Cropping System Which:

a. conforms to government restrictions

b. allows farmers to produce their own subsistence requirement plus a surplus to sell

c. maintains soil fertility over the long term

d. maximizes production within limits

9. Evaluation of Cropping Patterns

a. improvement of farmers' existing farming methods

b. final evaluation at several locations before implementation of research results

i. objective: to establish a base line
ii. does the farmer have expertise to use inputs effectively if they are available?

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iii. testing the new cropping patterns (new appropriate technology) for different farmers' conditions to get a measure of benefit and probability of success

10. Criteria and Rationale for Selecting New Appropriate Technology or Cropping Patterns

CRITERION A: farmers' existing cropping patterns (farming methods)

RATIONALE: to establish a base line check for comparison

CRITERION B: farmers' choice of cropping patterns (farming methods) if input and market constraints are removed

RATIONALE: to evaluate the farmers' level of technical competence and managerial skills, and uncover hidden socio-economic constraints

CRITERION C: introduce new cropping patterns (new appropriate technology) with inputs and market constraints removed and technical assistance provided

RATIONALE: to determine production and economic potential under high level of management

11. Research Design

a. design of the new technology (cropping patterns, etc.) based on farmers' existing methods

b. selection of farmers' fields: testing and replication

12. Focus Research on Cropping Systems which are agronomically and economically sound for the different soils and climatic zones of Egypt

William J. Russell

June 9, 1984

MULTIPLE CROPPING SYSTEMS

1. Introduction

2. Economic Determinants of Crop Type and Cropping Intensity

   a. physical factors

      i. availability of water
      ii. rainfall
      iii. temperature
      iv. physiography
      v. soil type

   b. social and economic factors

      i. labor
      ii. power
      iii. availability of inputs
      iv. cash and purchase of inputs
      v. markets
      vi. technical services

   c. farmers' socio-economic condition

      i. amount of labor
      ii. can farmer rent animal power or mechanical power?
      iii. amount of potential cash income
      iv. management skills of farmers
      v. markets
      vi. farm size
      vii. sense of security against theft
      viii. land tenure

3. Resource Requirements of Multiple Cropping

   a. for different cropping patterns

      i. crop sequencing
      ii. relay planting
      iii. intercropping
      iv. perennial crops

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b. nutrient needs and sources

   i. commercial fertilizer
   ii. nutrient materials from outside the farm
   iii. recycling nutrients from a single cropping system
   iv. recycling nutrients among various cropping systems on the same farm

c. farm mechanization - power requirements

   i. farms less than one acre
   ii. farms up to five acres
   iii. primary mechanization
   iv. secondary mechanization
   v. transportation

4. <u>Multiple Cropping Research</u>

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William J. Russell

June 13, 1984

IRRIGATION AND PLANT WATER REQUIREMENTS

1. Introduction
2. Definition of Terms
   a. consumptive use; consumptive water requirements
   b. effective rainfall
   c. net irrigation requirement; irrigation efficiency
   d. water application efficiency
3. Irrigated Small Grains
   a. wheat, barley, oats
   b. millet, grain sorghum
4. Irrigating Other Crops
   a. potatoes
   b. sugar beets
   c. alfalfa
   d. maize (corn); sweet corn
   e. citrus trees
   f. almonds
   g. dry field beans
   h. soy beans

5. <u>Estimating Consumptive Use of Water</u>

   a. temperature

   b. relative humidity

   c. length of day

   d. available moisture

Wendy Wilson

June 4, 1984

WOMEN'S PARTICIPATION IN RURAL DEVELOPMENT

1. Identifying Priorities

   a. national development targets

      i. community development
      ii. agricultural production
      iii. industrial growth

   b. goals for rural communities

      i. inventory of village needs
      ii. baseline social data
      iii. matching local demand with national targets

2. Training and Other Input Considerations

   a. identifying training strategy

      i. long and short term training: pro's and con's
      ii. problems of literacy training for women
      iii. child care
      iv. strategies of instructor training

   b. appropriate technology impact - effect on:

      household - farm - industry

3. Management and Follow-up of Projects Including Women

   a. on the village level

   b. project coordination

Wendy Wilson

June 7, 1984

THE SOCIOLOGY OF THE FARMER AS EXTENSION AGENT

1. Identification and Selection

   a. criteria for villages

      i. population size
      ii. proximity to a trade center and roads
      iii. farmer participation in other current projects
      iv. social and economic coherence of the village

   b. criteria for the farmer

      i. motivation and commitment
      ii. familiarity with the technologies introduced
      iii. social standing in the village
      iv. ability to communicate
      v. economic profile of the farmer

   c. identifying possible bottlenecks to technology acceptance and diffusion

      i. interest groups in the village
      ii. farmer interest in entrepreneurship
      iii. conservatism of farmers
      iv. land tenure and inheritance factors

2. Offering a Support System and Incentives

   a. formal and informal extension agents

      i. teachers, catalysts of change, demonstrators
      ii. strategies of intervention and realistic schedule of goals
      iii. information management and consistency

   b. incentives: material and social

      i. anticipation of possible prestige incentives
      ii. cash and kind incentives
      iii. consistency within geographical areas
      iv. timing

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3. <u>Follow-Through and On-going Incentives</u>

a. training of the farmer

b. investment and market possibilities

c. the role of the cooperative

d. follow-up visits and acceptance rate

3. "recyclage" - review training

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Wendy Wilson

June 11, 1984

THE ROLE OF SOCIOLOGICAL ANALYSIS IN TECHNOLOGY TRANSER

1. Methodologies: Qualitative and Quantitative Data Generation
2. Purposes of Sociological Analysis
   a. to gather and analyze data describing existing social and economic characteristics of a community (diachronic)
   b. identification of socio-economic trends (synchronic)
   c. identification of historical determinants of existing behaviors and social/material conditions (synchronic and diachronic)
3. Possible Uses and Objectives of Social Analysis for Technology Transfer (pre-implementation)
   a. selection of beneficiary community
   b. identification of problems for technology transfer to address
      i. labor bottlenecks
      ii. social disruptions due to problems of health, production or communication
      iii. marketing problems of a social nature
   c. anticipated benefits of the intervention
      i. increased household revenues
      ii. improved living conditions
      iii. freed-up time
      iv. increased production for local consumption or export
      v. increased market activity
      vi. increased and improved citizen participation
      vii. skill development

d. identification of major actors

e. anticipation of acceptance rate and problems of resistance

4. Relevant Data to Technology Acceptance

a. labor demands

b. reproduction cycle of the household

c. census and reproduction of the target community

d. time management

e. household revenues and expenditures

f. market linkages and price trends

g. savings and investment patterns

h. identification of interest groups

i. inventory of production activities

5. Uses in Implementation Stage (Agriculture)

a. measurement of participation

b. analyses of resistance to intervention

c. identification of social impact

i. loss of prestige
ii. loss or gain of revenue by particular groups
iii. household stability
iv. land tenure changes

6. Evaluation of Suitability of Technical Interventions

a. effects on community labor distribution

b. effects on household labor

c. effects on community development or out-migration

d. market activity

e. reference to benefits anticipated

APPENDIX 5

INTERVIEWING QUESTIONNAIRE

Village Profile / use separate answer sheet
(should be asked of village authority and MOA key participant)

1. Where is the closest commercial center (market)?

2. Has business (trade) increased since the new technology has been adopted by the village (YES _____ NO _____)?

3. Has trade increased? (If YES, HOW?)
_____

4. What is the local source of water?
   (a) FOR BATHING and IRRIGATION (mark letter and source)
   (b) FOR DRINKING (mark letter and source)

5. What are the major crops?

6. Has production improved for the (note crops) farms because of this project?

7. Are there village men working in Cairo, abroad in the Gulf or in Saudi Arabia? (IF YES) go to 8.

8. Many ____ few ____

9. Do fewer men go now because of the new technology in the village? (YES - NO).

10. The closest village is:
    (a) 1 - 3 miles away
    (b) 4 - 8 miles away

11. Has anyone from this village participated in the use of the new technology? (YES - NO)

12. If yes, (a) many? ____ (b) some? ____ (c) few? ____

13. Land Tenure I. RENT II. OWN III. SHARE
    a) MOST PEOPLE
    b) HALF OF VILLAGE
    c) FEW PEOPLE

    <example, mark I-a as answer>

14. Those who can read and write in the village are
(a) few (b) many (c) some (d) name

15. Did the project help some villagers improve reading skills?

16. The village received visits from extension workers or project personnel (a) often (b) seldom (c) never

17. How many times would you say?
per month (a)
in 3 months (b)
in 6 months (c)
in a year (d)

INFORMANT/GENERAL INTERVIEW

18. Does informant (own, use) new technology? (YES - NO)

<u>If no</u>

19. Can informant describe it? (YES - NO)

20. Did informant attend demonstration? (YES - NO)

21. What kept (him/her) from (doing, using) new technology? <identify problem>

<u>If yes</u>

22. Can informant describe the new process? (YES - NO)

23. Who participates (helps) with the use of this new process (describe relative, or neighbor)?

24. Is work going better? (YES - NO)

25. Have household revenues increased as a result? (YES - NO)

26. Have production expenditures decreased? (YES - NO)

27. Have you been able to save more money? (YES - NO)

28. Do you own the land you farm? (YES - NO)

29. What is your biggest problem?

APPENDIX 6

SSMA SUB-PROJECTS (MOA)

NO.	NAME/START DATE	DESCRIPTION	PROGRESS	1	2	3	4	5
1	Using Pheremone Traps for Insect Control: 3/82	To manufacture and distribute pheremone traps to help control cotton leaf worm (injurious to cotton, soy beans and citrus).	Traps manufactured in a rural workshop; distributed to 63 farmers in 10 villages	yes	yes(a)	yes(b)	F-some M-1	yes
2	Integrated Irrigation-Machinery Management for Small Individual Holdings: 3/82	To spread the use of long furrow agriculture and siphon tube/pipe irrigation (sub-project No. 9). Increases land use efficiency by 10% as less land is used for borders and thus increases yields; decreases weeding.	Reportedly adopted by over 200 farmers in 32 villages. 3000 siphon tubes produced. Small Farmer Production project has adopted this sub-project's output.	yes(a)	yes(b)	yes(c)	F-yes M-1	yes
3	Developing a New Machine for Levelling Heavy Soils of Small Holdings: 3/82	A simple secondary tillage machine made from local materials which can scrape and do finishing work on a field; not a true leveller. Cost: approximately LE 400; appropriate for long furrow agriculture.	Just out of prototype stage; not yet available for farmers, but once manufacturers established, SFP project will give credit to its participating farmers to purchase finishers.	yes(a)	yes(b)	yes(c)	F-not yet M-not yet	can be

1 Appropriate?
2 Replicable at Reasonable Cost?
3 Cost Effective vs. traditional activity?
4 Adopted by Small Farmer (F)/ Small Manufacturer (M)?
5 Used Effectively?

SSAA SUB-PROJECTS (MOA)

NO.	NAME/START DATE	DESCRIPTION	PROGRESS	1	2	3	4	5
4.	Biogas/Organic Fertilizer Production from Wastes and Refuses: 4/82	To develop biogas units to produce methane for cooking, lighting, and heat.	11 units built by project. 6 units in villages, 4 at universities and 1 in research center. 5 farmers built their own in Tahrir and El Sharkia provinces.	Limited	yes(a)	yes(a)	F-(a) M-2	Assumed to be where in use
5.	Application of Soluble Fertilizers with Irrigation Water: 4/82	To develop a 20 liter tank on wheels to allow farmers to take fertilizer in solution and meter it into irrigation water- labor saving; more even distribution of fertilizer.	Have distributed approximately 60 units, but tanks have been in use for only one year. Potential corrosion problem with fertilizer will eventually cause inaccurate metering.	yes	yes(a)	yes(b)	F-yes M-1	Yes
6.	Modification of Manual and Motorized Equipment for Crop Harvesting on Small Holdings: 4/82	To modify imported mowers, combines and reapers to minimize crop loss in harvesting and decrease turnaround time for next crop planting.	Many being tested; manual reapers not practicable because of debilitating effects of bilharzia. Sickle bar mower being used by custom operators under SFP project.	yes(a)	not yet known(b)	not yet known(c)	F-not yet M-not yet	not yet
7.	Revival of Raw Silk Production Production in Egypt: 3/82	In collaboration with CRS to encourage rural families to raise silkworms, produce cocoons, and reel thread. Weaving and sale of fabric is a separate activity carried out by CRS.	Successful- over 500 families reported to have been trained- 6 reeling machines produced; 38,000 mulberry tree seedlings distributed.	yes	yes	n/a(a)	F-yes M-1	yes

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SSAA SUB-PROJECTS (MDA)

NO.	NAME/START DATE	DESCRIPTION	PROGRESS	1	2	3	4	5
8.	Manufacturing Bee-Hives from Non-wooden Materials: 3/82	To stimulate bee-keeping activities in rural areas through manufacturing inexpensive bee-hives from materials such as palm ribs, stalks and plastic-jute sacks.	Estimated 100 hives currently in use.	yes	yes(a)	yes(b)	F-yes M-2	yes
9.	Increasing the Efficiency of Border Irrigation for Small Holdings: 4/82	To train farmers in use of long border irrigation utilizing plastic siphon tubes and pipes.	Merged into sub-project No. 2; see progress section and footnotes for sub-project No. 2.	yes(a)	yes(b)	yes	F-yes M-1	yes
10.	Production of Seedlings for Wind Barrier Trees and Ornamental Plants within Rural Communities: 5/82	To introduce trees and ornamental plant seedling operations to the Egyptian farmer; to train the farmer to make containers for ornamental plants; use of plastic greenhouses (see sub-project No. 22) as nurseries.	Some seedlings distributed to farmers; no progress reported to date for farmersmaking ornamental plant containers or using plastic greenhouses as nurseries.	yes	not known	n/a(a)	F-seedlings yes; ornamentals no M-n/a	yes
11.	Development of Technical Skills in Rural Areas (Rural Workshops): 5/82	To develop various vocational skills - mechanical, welding, sheet metal work, carpentry, etc.; how to operate a rural workshop.	Eight tool units distributed in each of seven governorates. One tool unit distributed in South Sinai (see sub-project No. 53).	yes	not known	n/a(a)	F-not known (b) M-not yet	assumed to be

SSAA SUB-PROJECTS (MOA)

NO.	NAME/START DATE	DESCRIPTION	PROGRESS	1	2	3	4	5
12.	Improvement of Local Traditional Irrigation Water Lifting Devices: 5/82	To develop a more efficient traditional water-lifting wheel (sakia) which will pump more water per unit of water input.	Still in prototype stage; templates prepared so that small manufacturers can make improved sakia; will be slow to be extended because it is a "replacement" item. A potential cost problem is that the modified sakia requires a wider sump.	yes	(a)	yes(b)	F-not yet M-2	not yet
13.	Production of Medicinal Herbs and Distillation of Aromatic Oils: 5/82	To promote growing herbs such as basil, chamomile and pepperment through better farm management, herb drying; also to train farmers in commercial distillation of aromatic plants for their essential oils; to introduce farmers to growing gouar - a non-traditional summer cover crop.	Herb drying trays produced and distributed to farmers. Condenser provided to help distill plants into essential oils. 20 farmers in 2 governorates involved. No progress this year in distillation due to excellent market for dried products.	yes(a)	yes(b)	yes(c)	F-yes M-2	yes
14.	Water Supply and Sanitation Units for Rural Houses: 5/82	To develop a tank-cart with a hand pump so water can be pumped to roof-top reservoir for gravity feed to household.	Built 10 100 liter tank-carts at a cost of LE 100 each.	not known(a)	not known(b)	probably not(c)	F-not known M-2	not known

SSAA SUB-PROJECTS (MOA)

NO.	NAME/START DATE	DESCRIPTION	PROGRESS	1	2	3	4	5
15.	Developing a Small-Scale Incubator and Hatchery for Poultry Production: 5/82	To design an inexpensive egg incubator and chick brooder suitable for local manufacture and for the small farmer.	Five egg incubators and three chick brooders designed and manufactured.	no(a)	no(b)	no (c)	F-not yet M-1(d)	not known
16.	Improvement of Egyptian Feta (White) Cheese at the Rural Household Level: 5/82	To improve the traditional method of cheese manufacture to obtain better quality.	Mini-lab established in one village - production now for market; three training sessions held.	yes	yes(a)	yes	F-yes M-n/a	yes
17.	Sprinkler Irrigation Device for Small Holdings: 5/82	To develop a portable, engine-driven pump set attached to a hose with sprinkler heads.	7 manufactured in SSAA workshop. SFP farmers adopting. Primarily used for fava beans and lentils. Cost LE 2000 with sprinkler hoses.	yes(a)	yes(a)	yes(b)	F-yes M-2	yes
18.	Production of Suitable Agricultural Guidance Information (Booklets, Leaflets): 5/82	A misnomer in that the sub-project objective changed, i.e., to produce an integrative, comprehensive almanac of agricultural production and operations in Egypt.	An almanac was produced and printed; in demand by professionals.	yes	n/a	n/a	n/a	yes
19.	Local Preparation of Renneting Enzyme from the Rumen of Mature Cattle: 5/82	To promote the preparation of the renneting enzyme for cheese production.	One farmer has had good results.	yes	yes	yes(a)	F-1 M-n/a	yes

SSMA SUB-PROJECTS (MDA)

NO.	NAME/START DATE	DESCRIPTION	PROGRESS	1	2	3	4	5
20.	Developing A Small-Scale Seed Drill for Small Holdings: 5/82	To develop an inexpensive, animal-drawn seed drill to decrease the time and effort in planting and to achieve increased productivity through more uniform seed placement.	In early experimental stage and not yet ready for production. Some question as to whether the seed singularity device will meet the needs of the Egyptian farmer.	not yet (a)	not known	not known	F-not yet M-2 (b)	not yet
21.	Developing a Multipurpose Manual Transporting Cart for Rural Areas: 7/82	To design for local manufacture a simple, multipurpose hand cart for use in the field; to substitute for using animals for transport to and from the field.	Cart designed, manufactured, tested, and modified. Four units produced to be first used in extension fields. Cost of manufacture LE 90.	not known(a)	yes(b)	not known	F-not yet M-1	not yet
22.	Utilization of Plastic Sheets and Greenhouses for Vegetable Production on a Small Scale: 10/82	To build plastic greenhouses for accelerated vegetable production. Meets needs of specialized group of farmers growing vegetables for urban markets.	76 built in 15 different governorates. A few have been built by individual farmers. Cost of greenhouse (4m x 36m) = LE 650-850.	yes(a)	yes(a)	yes(a)	F-yes M-2	yes
23.	Using An Artificial Media Made of Farm Refuses as a Substitute for Peat Moss: 5/82	To design a mold to produce cubes made of sawdust, sand and clay soil as seed starter material substituting for imported peat moss.	Substitute mixture (not molded into blocks) in use to start seedlings. Mold not out of prototype stage yet; requires modification to reduce amount of hand strength needed to operate; higher germination than with peat moss. Costs approximately LE 12.	yes(a)	yes	yes(b)	F-not yet(c) M-not yet	not yet

SSAA SUB-PROJECTS (MDA)

NO.	NAME/START DATE	DESCRIPTION	PROGRESS	1	2	3	4	5
24.	Winnowing and Sieving Unit to be Attached to Threshing Machines: 5/82		NOT STARTED					
25.	A Diaphragm Type Pump: 5/82		NOT STARTED					
26.	Using Organic Farm Refuses as a Feedstuff for Farm Animals: 5/82	To improve and expand the use of farm refuses for animal feeding based on mechanical treatment (chopping) of refuses plus addition of molasses and an already prepared mixture of urea, vitamins and minerals.	Limited to those 57 farmers who received supplies of prepared urea;vitamin mixture and molasses; limited availability of molasses and urea mixture for small farmers. Reported that TV program on this subject received approximately 10,000 letters asking for information. Central Extension Service information system not designed to handle this volume of requests.	yes	yes	yes(a)	F-57 M-n/a	yes
27.	Growing Algae As a Feedstuff for Poultry and Fish: 5/82	To develop a simple, inexpensive technique to grow blue-green algae as a partial alternative feed source for poultry and fish.	Slight; 4 farmers growing algae; aquariums in 6 villages.	yes(a)	yes(b)	yes(c)	F-4 M-1	yes

SSMA SUB-PROJECTS (MOA)

NO.	NAME/START DATE	DESCRIPTION	PROGRESS	1	2	3	4	5
28.	Testing the Efficiency of a Manual Cotton Planter: 5/82	Used planter designed in 1981 to precision-plant delinted cotton seed, to reduce seeding rate, decrease need for thinning, and allow for regular application of nitrogen and phosphorous fertilizer.	Made in MOA shop; tested by 20 farmers, but only for clover, beans and maize. Costs LE 100 to manufacture. 31 produced in 1981 in MOA shop.	yes(a)	yes	yes(b)	F-20(c) M-not yet	yes(c)
29.	Design and Application of a New Generation of Direct Contact Weed Sprayers: 5/82		NOT STARTED					
30.	Development of Food Industries for Small Farmers in the Fayoum Governorate: 6/82	Similar to sub-project No. 31.	Training carried out in the Food Industries Laboratory of Fayoum University; extension work in homes being done.	yes	yes	yes	F-yes M-n/a	yes
31.	Food Processing in Rural Areas: 6/82	To introduce and train families in making preserves and pickling vegetables, vegetable drying, vegetable freezing, packaging and raising quality of products produced to increase potential sales.	Significant progress made in a number of villages/towns. Sub-project No. 30 is similar; sub-projects No. 50, 51 incorporate elements of this sub-project.	yes	yes	yes(a)	F-yes(b) M-n/a	yes

SSAA SUB-PROJECTS (MOA)

NO.	NAME/START DATE	DESCRIPTION	PROGRESS	1	2	3	4	5
32.	A Simple Butter Churn: 7/82	To design a simplified butter churn for manufacture and use in rural areas to produce higher quality butter.	Designed 3 types of churns; 60 churns manufactured. One manufacturer located in Cairo - farmers have difficulty in buying it. Churn costs LE 20.	yes	yes	yes(a)	F-slight M-2	yes
33.	Developing Some Conventional Services for Banana Farms: 6/82	To develop a "package" of technical methods for banana growers: foliar fertilizer, herbicides, early pruning, use of polyethylene bags to cover bushes, and development of banana shoot (sucker) trimmer.	"Package" being successfully extended through SFP. 150 shoot trimmers provided. Reportedly, orders for 1000 more. According to sub-project leader, 500 trimmers have been built in a rural workshop and sold at LE 8.50 each. Allows farmer to plant shoots rather than have to purchase from nurseries. Under SSAA, 10 nurseries were built for farmers in 6 villages.	yes	yes(a)	yes(b)	F-yes M-1(c)	yes
34.	Caster Silkworm Production and Silk Spinning/Weaving in the Domyetta Governorate: 6/82	To introduce castor silk production in the region and encourage rural families to adopt this activity through training, supply of silk worms, and convincing more producers to plant castor.	Slight; difficulties with spinning and weaving thread manually; winter weather (12/82) killed off all sub-project castor silkworms.	yes	yes(a)	not known (b)	F-not yet M-n/a	not yet

SSAA SUB-PROJECTS (MOA)

NO.	NAME/START DATE	DESCRIPTION	PROGRESS	1	2	3	4	5
39.	Raising Rabbits in Boxes: 6/82	To increase the raising of rabbits as a source of meat and fur through the introduction of inexpensive wooden rabbit boxes and improved breeds of rabbits.	Rapid expansion; 100+ families engaged in rabbit raising. 3 entrepreneurs now raising rabbits commercially to sell to new rabbit raisers. Reportedly over 1000 boxes manufactured in Mallawi area to date.	yes	yes(a)	yes(b)	F-100+ M-2	yes
40.	Foliar Fertilizer Application for Vegetable Production: 6/82	Application of water soluble fertilizer from backpack sprayers; suitable for crops grown on sandy soils.	Reportedly 723 farmers in 2 villages testing this process. Extension agent extremely well organized.	yes	yes(a)	yes(b)	F-yes(c) M-not yet	yes
41.	Intensive Cropping Techniques for Increasing Land Productivity: 6/82	To introduce farmers to benefits of intercropping and relevant cultivation practices.	Reportedly worked with 306 farmers in the delta.	yes(a)	yes	yes(b)	F-yes M-n/a	yes
42.	Manufacture and Application of Drip Irrigation Units for Small Holdings of Fruit and Vegetable Production: 6/82	To produce drip irrigation units for use on porous sandy soils unsuitable for flood irrigation.	Standard specifications for all components developed. Costs LE 600-800/feddan for complete unit. Ministry of Military Production to produce these units.	yes(a)	yes(a)	yes(b)	F-yes M-not yet	yes

SSAA SUB-PROJECTS (MOA)

NO.	NAME/START DATE	DESCRIPTION	PROGRESS	1	2	3	4	5
35.	A Manual Flame Blower for Weed Control: 6/82	To produce a flamer to remove weed growth from irrigation and drainage canals.	5 prototypes were built - needs further testing and refinement, as well as economic analysis and examination of manufacturing considerations.	yes	not known	not known	F-not yet M-1	not yet
36.	Local Production of Yellow Carrot Seed: 8/82	To develop on-farm production in cooler regions of Egypt so that temperature requirements of growing carrots for seed are met; developing extension methods to convince farmer of viability of domestically produced seed. Use of refrigerated room to produce vernalized seed.	Tested with 6 farmers at 4 different locations on a total of 3/4 feddan. No grower found to produce carrot seed on commercial basis because of lack of certification of seed produced.	yes(a)	yes	yes(b)	F-6(c) M-n/a	yes(c)
37.	Improvement of White Cheese Quality: 6/82	To raise quality of cheese by addition of preservatives and use of simple tools to replace traditional ones.	Some training; reportedly more than 50 sets of tools manufactured by rural carpenters in villages where initial sets distributed.	yes	yes (a)	yes(b)	F-37 M-some	yes
38.	Production of Better Quality Milk: 6/82	To improve milk processing through better milking practices, improved hygienic practices, and the provision of simple tools.	Distributed 10 separators and 20 milk cans. Reportedly training 100 farmers in each of 10 villages.	yes	yes(a)	yes(b)	F-50 M-1	yes

SSAA SUB-PROJECTS (MDA)

NO.	NAME/START DATE	DESCRIPTION	PROGRESS	1	2	3	4	5
43.	Forming Conical Soil Shapes for Intensive Vegetable Production: 9/82	To develop for the small farmer a means of effectively increasing the amount of "land" area at his disposal; to be used for certain vegetables and strawberries.	At end of experimental stage, prototype developed; 16 farmers using it.	yes	yes(a)	yes(b)	F-16 M-1	yes(d)
44.	Production of Onion Seedlings and Onion Bulbs Using Manual Planters: 7/82	To develop a single row planter to direct-plant onion seeds and bulbs.	Planter developed; reportedly being produced in local workshops; distribution by SFP to 26 farmers.	yes	yes(a)	yes(b)	F-37 M-?	yes
45.	Self-Powered Insecticide Sprayer: 7/82	To design and have manufactured a simple, manually driven insecticide sprayer; training for farmers in its use.	Prototype developed, field tested, improved; second prototype developed.	not known(a)	not known (a)	not known (a)	F-not known(a) M-1	not known(a)
46.	Development of Small-Scale Food Industries in Rural Areas: 10/82	See sub-project No. 31.					F-? M-1	
47.	Development of Tools and Devices for Collecting Fruits and Vegetables: 10/82	To design and produce tools for vegetable and fruit picking; to reduce vegetable and fruit losses and increase the efficiency of workers.	Prototypes have been made.	yes	yes(a)	not known	F-not yet M-1	not yet

SSAA SUB-PROJECTS (MDA)

NO.	NAME/START DATE	DESCRIPTION	PROGRESS	1	2	3	4	5
48.	Developing A New Machine for Fine Levelling: 4/83	To develop a simple, maneuverable leveller made of scrap steel.	Has been accepted by farmers and is being manufactured by 3 workshops. Adapted to work on Eastern Bloc tractors (single action hydraulics). Costs LE 350 to produce. Will be purchased by farmers under SFP and is being promoted by AMP.	yes	yes(a)	yes(b)	F-starting M-2	yes
49.	Simple Multipurpose Agricultural Structures: 7/82	To develop low cost sheds and buildings.	98 units produced of which 50 for MDA use, 20 for export.	no(a)	no	no	F-no M-no	no
50.	Development of Rural Women's Activities and Standard of Living: 7/82	To promote various income-generating activities at the household level; literacy and nutrition classes.	Established a women's center to process, store and distribute foodstuffs. Included a bakery and a freezer. Approximately 400 women received literacy and nutrition training.	yes	yes(a)	yes(a)	F-yes(b) M-n/a	yes
51.	Development of Small Farmer Activities and Standard of Living in the North Sinai Governorate: 12/82	To transfer appropriate sub-project activities to farmers/women in the area; literacy and nutrition training.	65 families completed literacy course; 35 families participating in goat breed upgrading; 30 families engaged in rabbit raising; 4 plastic greenhouses installed; foliar fertilizer application successful.	yes(a)	yes(a)	yes(a)	F-yes M-3	yes(a)

SSAA SUB-PROJECTS (MOA)

NO.	NAME/START DATE	DESCRIPTION	PROGRESS	1	2	3	4	5
52.	Application of Modern Technology to Goat Production: 9/82	Designed as initial phase of long term effort to improve goat production in the North Sinai via genetic upgrading of local herds and better animal husbandry practices.	Modest progress; pens built at El-Arish; 200 improved breed goats delivered to El-Arish and to Cairo University goat reproduction center.	yes	yes	yes(a)	F-35 M-n/a	yes
53.	Development of Small Farmer Activities and Standard of Living in the South Sinai Governorate: 12/82	Experimental farming settlement established with 20 agricultural engineers. Used plastic tunnels, improved seed and tractors to produce melons, chrysanthemums and tomatoes. 250 feddans used.	Eight tool units (sub-project No. 11) distributed. Work in progress.	no (a)	yes(b)	yes(b)	F-no M-not yet(c)	yes(d)
54.	Introducing Different Technological Methods for Rice Production: 1/83	To test varieties of rice for direct planting and to help eliminate need for nurseries and hand transplanting.	Tested 4 varieties of rice and used finisher developed under sub-project No. 3.	yes	(a)	(a)	F-not yet M-n/a	not yet

Footnotes for Sub-Projects

No.

1. (a) One trap costs LE 8 to manufacture; trap life = 7 years; one pheremone capsule costs 5 piastres; use 20 capsules/year; cost per year per feddan - LE 2.

   (b) For those farmers who cannot afford spraying program; spraying costs LE 70/feddan/year; advantage of spraying is use of broad spectrum pesticides.

2. (a) With use of land leveller.

   (b) Entails hiring tractor service at approximately LE 10/feddan; siphon tubes cost LE 3 each.

   (c) increases land use efficiency by 10% by utilizing areas of the border ridges, and therefore yields; 10-12 siphon tubes per feddan required; tube life = five years; yearly cost = LE 6/year/feddan. Assuming farmer who grows lentils receives LE 90/ardeb, and average yield = 6 ardeb/feddan, 10% increase in yield = LE 54 increase in income vs. LE 6 cost.

3. (a) With tractor; more appropriate than wooden drag (kassabia) now used.

   (b) Only for farmers with access to tractor service, or farmer who has tractor and can get credit, or for farmers, who as a group, could afford to purchase/rent finisher and tractor services.

   (c) Assumptions for kassabia vs. finisher:

      (i) tractor is rented for LE 4/hour

      (ii) Labor receives LE 2.50/6 hour day; tractor driver used with finisher; tractor driver and two men standing on kassabia (for weight) used with kassabia

      (iii) finisher has field efficiency of 85% and a speed of 5 m.p.h.; kassabia - 50% and 4 m.p.h.

      (iv) finisher costs LE 400; kassabia costs LE 50; interest rate = 14%

      (v) finisher costs LE 1.38/feddan; kassabia = LE 2.34/feddan

(vi) for man doing custom work with a tractor and the finisher:

$$\frac{\text{cost of finisher - cost of kassabia}}{\text{cost of kassabia/feddan - cost of finisher/feddan}} =$$

$$\frac{\text{LE 400 - LE 50}}{\text{LE 2.34 - LE 1.38}} = \frac{350}{.96} = 360$$ feddans to pay back the investment in the finisher, or approximately two years is estimated

(vii) Farmer is probably charged the same fee as with a kassabia, but his yield reportedly increases up to 25% with use of finisher.

4. (a) Only economic in those areas, e.g., Tahrir, El-Sharkia, where there are often shortages of propane. Only in these areas are biogas generators truly appropriate, replicable at reasonable cost and cost effective. In other areas where supply of alternative petroleum products is assured, subsidized petroleum product prices make generators uneconomic.

5. (a) Assumed to be.

(b) Assumed to be since replaces some granular fertilizer, is labor saving and allows more even distribution of fertilizer.

6. (a) For farmers with access to tractors.

(b) and (c) Most machines still being tested. Sickle-bar mower believed to be cost effective. No information yet available for other machinery.

7. (a) Not applicable since this is the traditional activity. Reeling by family - labor considered "free":

Sale of 1 kg of silk - LE 40		
Production costs:		
2 skeins @ LE 13/skein		26
kerosine		1
Profit	LE	13

8. (a) Non-wooden beehives cost LE 1-3 to make/manufacture.

(b)

	Wooden (traditional)	Non-wooden
Cost	LE 30	LE 3
Life	20 years	3 years
Depreciation	LE 1.5	LE 1.0
Maintenance	.5	-
Total cost/year	LE 2.0	LE 1.0

The objective is to reduce the capital requirement to establish an apiary.

9. (a) and (b) See sub-project No. 2 footnotes.

10. (a) No comparison possible since this is a new activity.

11. (a) No comparison possible since this is a new activity.

(b) Evaluation team only saw one location which was in process of being established.

12. (a) Only when the current sakia needs replacing.

(b) Animal powered conventional sakia estimated to cost LE 29/feddan/year; however improved sakia is 20% more efficient, or costs LE 22.4/feddan/year. A sakia can irrigate a maximum of 13 feddans. A farmer with 13 feddans will save 13 x LE 5.6 or LE 72.82/year. New sakia costs LE 150, thus payback period is two years. If farmer has to put in a new sump, cost increases to LE 500 or a payback period of 6.9 years. It is doubtful that a farmer would replace a conventional sakia in good repair (a sakia has a life of 25 years) with an improved sakia; it is more likely that he will wait until the sakia needs replacing.

13. (a) If can promote higher market prices for output and assure timely transportation to markets.

(b) Wooden drying boards cost LE 4 each, assumed to have a life of 10 years, therefore yearly cost/board = 40 piastres.

(c) Traditional board made of palm ribs, cost LE 2 and lasts 1 year, therefore wooden drying boards cost effective. Also with wooden drying boards, herbs dry faster with 10% less leaf loss and 15% less labor required.

14. (a) Unknown; level of need is uncertain.

(b) Unknown; level of need is uncertain.

(c) Most villages have water sources within short distances of people's homes. Estimate one person spends one-half hour per day getting water for daily use for family.

15. (a) See following footnotes (b) and (c).

(b) Not for the small farmer.

(c) Yes if compared with natural hatching, but the comparison

does not apply since natural hatching is done to provide household needs, not commercial activity. If compared with commercial scale incubating and hatching operations, it is not cost effective on a per unit basis.

(d) 20 were produced (by one small manufacturer) of which 10 were sold to "private sector enterprises" and 10 were exported to Saudi Arabia and the United Arab Emirates.

16. (a) At village or cooperative level.

17. (a) Yes for groups of farmers.

(b) Yield increase experienced is 25% or 1.5 ardeb/feddan (ardeb = 160 kg). Farmer receives LE 90/ardeb. Therefore his income increases LE 135 (1.5 x LE 90) per feddan per year. Eight farmers, with one feddan each, would, as a group, gross LE 1080 extra per year. Device costs LE 2000. Assuming relatively modest operating costs, the payback period would range from two to three years.

19. (a) Avoids traditional slaughter of calves. Costs 80 piastres/liter vs. 120 piastres/liter with use of calves' rumens.

20. (a) Not in its current stage of development.

(b) One small manufacturer machined axles for experimental models; one manufacturer made sheet metal hoppers for the model.

21. (a) Evaluation team, because of time constraint, did not see this sub-project, nor discuss it with sub-project principal investigator.

(b) Perhaps for a small group of farmers to share usage.

22. (a) Appropriate for nursery growers of seedlings, large farmers who can afford greenhouses. Farmer can grow high value cash crops in the winter months and take advantage of off-season high prices. Tomatoes - 2 cases:

(i) Farmer can start tomato plants for early transplanting. One greenhouse is sufficient to start enough plants to plant one feddan. Farmer can harvest tomatoes early in season.

(ii) Farmer can grow tomatoes in greenhouses to maturity and get twice the yield in winter and best early market prices (LE 1/kg vs. normal price of LE 0.2/kg). A 4 x 36 meter greenhouse covers .034

feddan. Trials have shown a potential production of 20 tons/feddan. Therefore, 20 T/feddan x .034 feddan x 1000 kg/ton x LE 1.00/kg = LE 680 gross income. The life of the plastic of the greenhouse is three years. Assuming that plastic is 1/2 the cost of the greenhouse, the estimated net profit of growing one crop of tomatoes to maturity in a greenhouse would be:

Gross income =	LE 680	
Depreciation	(142)	(assuming he grows only 1 crop/year) (850 ÷ 2 ÷ 3 years = LE 142)
Labor, fertilizer, etc.	(200)	
Net income	338	

23. (a) With modification of mold and for farmers who have nursery operations. One nursery might have 500 end-users who would potentially get their seedlings at a somewhat lower price.

    (b) Believed to be because of low cost, life of approximately 5 years, and greater germination rate achieved with the cubes. Imported peat costs LE 7/kg. The soil and sand for the cubes entail only transport costs and the farmer needs only access to a sawmill to get free sawdust.

    (c) Mold not yet in use.

26. (a) Cost effective if compared with free market price of traditional feed concentrate:
    1/2 liter of mixture costs 15 piastres and substitutes for 2 kg of concentrate which costs 40 piastres on free market. If compared with subsidized price of 8 piastres for 2 kg, it is not cost effective.

27. (a) For farmers with some technical knowledge.

    (b) Assumed to be; aquarium costs LE 40 to produce.

    (c) Algae can replace 25% of the soybeans in poultry feed concentrate and has the same nutritional value. Cost of algae is 60 piastres to replace the like nutritional value of soybeans which costs 240 piastres.

28. (a) 10 farmers can share one planter.

    (b) Get uniform stand, less seed needed, higher germination rate, less need to thin plants.

    (c) Testing.

31. (a) For example, apricot jam:

Cost	LE
116 kg apricot @ 25 piastres/kg	29.00
50 kg sugar @ 50 piastres/kg	28.00
Lemon flavoring	1.50
240 jars @ 7.5 piastres/jar	18.00
Labor, transportation, storage	23.50
Total	100.00

Income	
Sales:	
240 jars @ 50 piastres/jam	120.00
Net profit	20.00

(b) Unknown

32. (a) 25% increase in amount of butter obtained from 10 liters of milk. Also time-saving, and less risk of milk spoilage.

33. (a) For farmers who can get credit.

(b) Package cost per feddan:

	LE
Potassium supplement incl. labor	45.00
Foliar fertilizer incl. labor	21.00
Plastic sleeves 600 x 1.5/each	90.00
Herbicide including labor	17.00
Trimming tool (8.50 ÷ 2 years life)	4.25
Cutting bill flowers	15.00
Total	192.25

Maximum Yield per Feddan

without package	8 tons
with package	10 tons

One ton of bananas is reported to be worth LE 500. Thus 2 ton gain = LE 1000 less 192.25 = net maximum gain to farmer of LE 807.75.

(c) Shoot trimmer under SFP project.

34. (a) Believed to be; team did not see this sub-project nor have opportunity to discuss it with sub-project leader.

(b) Castor silk of lower quality than mulberry silk.

36. (a) Believed to be, but not yet sufficiently developed and extended. The task is to convince farmers that good seed can be produced locally.

(b) Imported seed costs farmer LE 10-12/kg; locally grown seed costs farmer LE 5/kg.

(c) Testing.

37. (a) No other alternative for producing saleable cheese from the home.

(b) Wooden tools cost farmer approximately LE 10 and have an estimated life of 6 years.

38. (a) Too expensive for the individual (LE 200); more appropriate for groups of farmers to use.

(b) 20% greater butter at content achieved, time of operation reduced, and decreased risk of total loss of milk through spoilage.

39. (a) Can cost from LE 10-40 depending on materials used and if made at home or by carpenter.

(b) Separation of males and females plus confinement in boxes of a limited number per box reduced the spread of disease, and increases females' fertility. New breeds (introduced) more fertile - get 40 offspring per year per female vs. 10 per year for local rabbits. Example of income potential follows:

Investment	LE
Wooden boxes 5 @ LE 25 each	125
4 female and 1 male rabbit	50
2 wooden boxes for rearing	50
Total investment	225

Operating Costs	
Feed -	
Concentrate	170
Green fodder	89
Labor	30
Depreciation of boxes (7 boxes x LE 2)	17
(Box costs LE 25, life of 20 years = depreciation of LE 1.25 + maintenance of LE .75/year)	306

Income

4 females x 5 breeding seasons x 8 = 160 offspring
mortality = 20; net offspring = 140
a pair (male and female) sell for LE 6 at 6 months of age to another farmer
Therefore gross profit:

70 pair x 6		= 420
less operating costs		(306)
Net profit	LE	114

There are the questions of disease (which can decimate rabbit populations) and of markets - how large are markets for rabbits as meat and for fur? How accessible are they?

40. (a) Foliar fertilizer price subsidized (LE 7.5/feddan vs. LE 22/feddan for granular fertilizer broadcast). Granular application uses more fertilizer per unit of area; knapsack sprayer costs LE 80; need 1 sprayer/feddan; labor costs of foliar fertilization high er because must spray 3-4 times/season vs. application of granular.

(b) Yield increase of up to 25%.

(c) Tested by 723 farmers; especially well suited for crops grown on sandy soils in North Sinai.

41. (a) Only if not mechanized and labor is available; cotton and onions can be intercropped, for example, with a 30% increase in overall yield.

(b) If mechanization is being considered, then must adopt row planting. Single block cropping or sequence planting allows for mechanization, proper fertilization and irrigation rates.

(c) Sub-project leader interviewed 100 farmers as a target group, developed plan with each farmer for an improved system, made refinements in plan based on farmer's experience in his own field.

42. (a) For farmer who can afford it.

(b) Conceivable that farmer can double his gross income. Positive effects on soil conservation and management.

43. (a) Mold costs LE 10.

(b) Trials have shown a yield increase of up to 2.4x; estimated to require 1/4 less labor than "conventional" growing; appears to be msot suitable for very small

farmer growing strawberries or certain vegetables. Only problem is that of nematode control.

44. (a) Planter costs LE 35 and has an expected life of 8 years.

(b) Seeding costs LE 950/feddan vs. LE 1150 using sets (traditional); planter allows for uniform stands, proper seed placement, less seed usage (20 kg vs. 60), decreased incidence of "doubles," less susceptibility to white rot disease. Planter can be used to plant other crops such as beans, maize, sorghum. Need for weed control greater with seeding.

45. (a) Team did not see self-propelled sprayer; pessimistic about economics - backpack sprayers and those powered by very small gasoline engines are in use.

47. (a) Only cost data available was for the 4 meter step ladder - LE 60. Fruit tends to be picked by crews of the middleman. Until marketplace demands better quality fruit, traditional harvesting methods will continue to be used.

48. (a) Costs approximately LE 350. Can be maneuvered on small fields. Cost requires a group of farmers to share.

(b) To be cost effective, must take advantage of long furrow agriculture and siphon tube irrigation, as well as the single acting hydraulics of Eastern Bloc tractors; leveller adapted to do this. Tanta Motors, Bihara Company and Mahmoud El Mahbrouk building levellers - primarily for AMP.

Also makes possible precision-levelled land for rice seeding (sub-project No. 54). Use 15% less water than with conventionally levelled land.

49. (a) 4 x 5 x 3 meter high steel building with cantilevered roof and removable sides is a good design for a small manufacturing shop. Meets needs of research stations and small steel fabrication shops, but at a price of LE 1000, it is out of reach of the small farmer.

50. (a) See comments for sub-project No. 31.

(b) Women.

51. (a) See sub-project No. 31 and comments on other sub-projects which have been adopted by this sub-project.

52. (a)

	Traditional Breed (Zharibi)	Sub-project Breed (Damascus)
Body weight	25.4 kg	39.8 kg
Milk production	69.6 kg	103.7 kg

No data available on feed conversion rates.

53. (a) For large scale effort, not for small farmer.

(b) Should be if sales of fruit and flowers to local and export markets more than cover costs.

(c) Perhaps for tunnel formers.

(d) Reportedly yes.

54. (a) No planting machine available yet other than a Japanese seeder costing LE 3500. Direct seeding of rice seed in field is rapid and requires little labor; field preparation with use of leveller (sub-project No. 48); would eliminate nurseries and hand transplanting.

APPENDIX 7

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