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FD- AAI - 129

QUARTERLY REPORT

October 1, 1980 to December 31, 1980

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EGYPT WATER USE AND MANAGEMENT PROJECT

Submitted By

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Contract No.
AID/NE-C-1351 (Egypt)
Project No. 263-017

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PROJECT STATUS

Introduction

The Mid-Project report was completed by the EWUP Staff and presented to Drs. Gil Corey and Itil Osman. Dr. Richardson, Campus Coordinator and Mr. Niel Dimick, USAID Project Officer accompanied the Review Team to the field sites and assisted them to interview staff members in the main office. The Review Team submitted its report to USAID late in December.

Dr. Quenemoen was appointed Technical Project Director effective November 1, 1980. Dr. Brooks returned to his faculty position at Oregon State University at the end of December.

The Field Teams completed measurements and observations for the summer crop season which ended in November. Work continued on summarizing and evaluating data. The Main Office staff was primarily devoted to assisting the Field Teams with data analysis.

The implementation phase of pilot programs began. Designs were completed for El Hammami pipeline, and meska 10 at Mansouria. Plans were also completed for Meska 26 at Minya. The Sociologists and Economists worked with farmers to explain the details of pilot programs, to get inputs from the farmers to get area planning, and to get cooperation from the farmers in implementing the work.

In December, it became apparent from comments of the Review Team that modification in the Project design should be considered. The Project Managers began developing plans for evaluating the Review Team recommendations. Preliminary plans for establishing task groups were developed in order to accommodate some changes recommended by the Review Team. Specifically plans were developed to bring the objectives of the Project into sharper focus with an appropriate management strategy for attaining these objectives.

The following paragraphs give some general comments regarding progress at each of the three Project areas.

Mansouria

Plans for the pipeline of El Hammami Pilot program are proceeding well. Eleven tenders were received for the construction contract.

The Sociologists have worked with the farmers at El Hammami and also at Meska #10, Beni Magdoui. The farmers have been informed about the Pilot program plans and proposals for various types of farmer organization were discussed.

Farmers were assisted with on-farm irrigation practices, insect control, farm record keeping and planning.

A field drain was constructed on Meska #6 during December. Trials are being conducted there to compare dead level irrigation with graded border. So far we have had problems with dead level fields. It has seemed almost impossible to get them adequately leveled and consequently water stands in certain spots for long periods making for poor germination of seeds. Continued work is necessary to establish other procedures for land leveling.

Kafr El Sheikh

During the fourth quarter of 1980, work at Kafr El Sheikh site was concentrated on the following activities:

1. Completion of summer season 1980 field trials on rice, cotton and corn: collection of yield data and primary analysis of all yield and irrigation data.
2. Commencement of on-farm pilot program activities as winter crops were established.
3. Continued planning of pilot program activities and water budget activities.

Yield measurements were completed on all the field trial sites with the completion of the second picking of cotton in early November. Tables 1 & 2, present a summary of the water applied and yield data for all the trials and the treatments under study. EWUP irrigation practices on corn resulted in an average of 27% less water applied than for the farmer while the yields obtained under both conditions were not significantly different, (Table 1). For the cotton trials, total EWUP and farmer applied water was not much different. However the yields

Table 1: Results of Summer 1980 Corn and Rice Field Trials

Site	Strip	Corn		Total Yield (ear+husk+grain) (Ton/Feddan)
		Total	Depth Applied (cm)	
3-02	A ₀ B ₀	144		4.47
	A ₀ B ₁	144		3.60
	A ₁ B ₀	110		3.97
	A ₁ B ₁	110		3.12
3-18	A ₀ B ₀	234		4.84
	A ₀ B ₁	210		4.69
	A ₁ B ₀	156		4.02
	A ₁ B ₁	149		4.78
				(Ton/Feddan)
		Rice	Straw	Grain
5-10	A ₀ B ₀	215	10.4	3.3
	A ₀ B ₁	209	10.0	3.7
	A ₁ B ₀	199	9.9	4.0
	A ₁ B ₁	185	9.6	3.4
	A ₁ B ₁ C	169	4.4	3.2
3-11	A ₀ B ₀	200	5.0	2.6
	A ₀ B ₁	199	5.3	2.8
	A ₁ B ₀	160	4.3	2.3
	A ₁ B ₁	164	5.8	2.4
	A ₁ B ₁ C	147	4.2	2.4
5-02	A ₀ B ₀	154	4.7	4.5
	A ₀ B ₁	151	5.5	4.2
	A ₁ B ₀	146	5.2	3.9
	A ₁ B ₁	153	4.6	3.7
	A ₁ B ₁ C	159	0.0	0.0

A₀B₀: Traditional farmer practice.

A₀B₁: Traditional farmer irrigation practice; EWUP agronomy practice.

A₁B₀: EWUP irrigation practice; farmer agronomy practice.

A₁B₁: EWUP irrigation and agronomy practice.

A₁B₁C: A₁B₁ with mechanical transplanting.

Table 2: Results of Summer 1980 Cotton Field Trials

Site	Strip	Total Depth Applied (cm)	Total Yield (Kentar/Feddan)
5-13	A_0B_0	93	4.05
	A_0B_1	93	5.00
	A_1B_0	109	6.70
	A_1B_1	114	6.98
3-14	A_0B_0	115	6.72
	A_0B_1	96	7.54
	A_1B_0	91	13.18
	A_1B_1	82	3.44
3-15 (a)	A_0B_1	70	7.16
	A_1B_0	71	5.86
	A_1B_1	78	6.94
3-15 (b)	A_0B_0	74	6.48
	A_0B_1	91	7.91
	A_1B_0	105	9.91
	A_1B_1	113	11.02
3-16	A_0B_0	151	8.87
	A_0B_1	136	8.64
	A_1B_0	147	11.72
	A_1B_1	151	11.30
3-17	A_0B_0	118	7.75
	A_0B_1	124	8.13
	A_1B_0	99	9.42
	A_1B_1	106	9.40

A_0B_0 : Traditional farmer practice.

A_0B_1 : Farmer irrigation practice; EWUP agronomy practice.

A_1B_0 : EWUP irrigation practice; farmer agronomy practice.

A_1B_1 : EWUP irrigation and agronomy practice.

on EWUP managed strips with improved irrigation practices were higher than on the farmer managed strips, (Table 2). This is attributed to land leveling and long furrow irrigation and the benefits of these to better water distribution.

EWUP irrigation of rice resulted in approximately 12% savings compared to the farmers' management while yields were approximately the same. For the mechanical transplanter trials, one strip was a complete failure and yields on the other 2 sites were less than achieved by the normal methods of transplanting. The team needs more training and experience in this method if it is to ever be effectively transferred for use by the farmer, (Table 1). Complete results and interpretation of the data collected during these field trials are being compiled in staff papers as time permits.

The Sociology team conducted a survey of the farmers involved in these field trials to determine their opinion of what was being done. These data have been presented in a staff paper. The biggest advantages which farmers recognize as a result of EWUP work thus far are related to the farm machinery (land leveling, land preparation, reduced labor requirements, etc.) and the acquisition of inputs (improved varieties, fertilizers, pest control, zinc, etc.). The biggest disadvantages noted by the farmers were related to the amount of time taken by EWUP in land preparation and the delays caused to the farmer. There were mixed reactions to other practices such as the mechanical transplanter, long furrow irrigation, etc.

Pilot program activities commenced with the selection of three sites in each of the Hammad and Manshia pilot areas. A total of 19.4 feddans was leveled. Level border irrigation systems were designed and installed and the areas were planted to wheat, flax and horse beans. On part of this area (1.6 f) furrows were made and sugar beets were planted. On all sites, the work is being concentrated on the wheat, flax and fool (i.e., the areas where leveling has been done). However, in most cases, these areas represent part of a particular land unit served by one sakia. The team is offering recommendations to the farmers on these sites on their other crops (berseem, onions). The planting irrigation was monitored on all sites to evaluate the irrigation

designs. Table 3 is a summary of these irrigations. The typical problem to be expected with the first irrigation of the season, such as increased advance times and high deep percolation losses, were encountered. These are expected to not be a problem in successive irrigations.

Continued planning for the Pilot programs has occurred. The on-farm work will continue as planned for the winter crops and plans will be made for the summer crops. Initial plans for organizing farmers to clean and maintain meskas have been made. Plans to change the inlet at Om'Sen and Hammad meskas (the flumes) were made. This work will be done during the winter closure period (January 81). The water budget work will be established as the relations with the farmers in the Om'Sen area improve.

Personnel Activities

Economists Ragy Darwish continued his long term training in Italy. Economist Yusif Yusif returned to the Project for approximately 1 month to help update the farm records. During the other 2 months of this quarter, the team operated with no economics personnel. The Team Leader, Samir El-Arif, officially resigned from EWUP in December 1980. Engineer Saad El Zarka, Director General of the Kafr El Sheikh Irrigation Department was named Acting Team Leader on November 25, 1980. Nehad Ibrahim, farm machinery specialist, resigned in December 1980.

TDY's visiting Kafr El Sheikh during the quarter:

Dr. Parviz Soltanpour - review work on summer field trials.

Mr. Rex Campbell - meetings with team to discuss communication problems.

Dr. Mel Skold - review project work.

Mr. Tim Gates - review project work, water budget status for area and work on irrigation data.

Mr. Mohammed Haider - survey of farmers in area for socio-economic data to be used in linear programming study.

The Project Review Team was at the site in early November.

El Minya

Meska #26 has been selected as a Pilot Project. The objective is to change the system to gravity irrigation with a head of at least 25 cm for all outlets. The Economists and Sociologists worked with the farmers on Meska #26 and selected 15 farmers for a meeting at the Project Office.

Table 5: Results of Planting Irrigations on Pilot Area Farms

Site	Date	Area (m ²)	Crop	Time of Irrigation (min)	Volume Applied (m ³)	Depth Applied (cm)	Soil Water Deficit (cm)	Change In Soil Water Content (cm)	Depth Stored ^{**} (0-90) (cm)	$E_a = \frac{\text{Depth Stored}}{\text{Depth Applied}}$ (%)	$E_r = \frac{\text{Depth Stored}}{\text{Soil Water Deficit}}$ (%)
5-02	12/4/80	5391	Sugar beet	900	1458	27.0	27.3	26.9	26.9	100	100
	12/9/80	1368	Wheat	126	208	15.2	17.4	16.0	15.2	100	87
	12/10/80	905	Wheat	55	90	10	16.8	15	10	100	60
	12/12/80	925	Wheat	135	648	26	17.4	18.5	17.4	67	100
	12/18/80	2512	Onion	105	271	11.7	4.09	6.24	4.09	35	100
5-11	12/2/80	1380	Bean	118	157	13.4	20	23.4	11.4	100	57
	12/3/80	820	Wheat	67	73	9.0	9.9	20.5	9.0	100	91
	12/13/80	855	Wheat	89	105	12.3	9.2	12.8	9.2	75	100
	12/13/80	634	Berseem	74	75	12	13.8	15.4	12	100	87
	12/16/80	815	Wheat	85	149	18	17.6	11.6	17.6	100	100
	12/17/80	532	Wheat	58	60	11.3	19	13.7	11.3	100	59
5-10	12/5/80	1951	Wheat	226	261	13.5	12.6	12.9	12.6	93	100
	12/6/80	1446	Flax	330	331	23	10.9	13.8	10.9	47	100
	12/7/80	1590	Wheat	336	261	16.5	12.6	11.5	12.6	55	100
5-22	12/9/80	1204.3	Wheat	143	191	15.7	17.9	12.8	15.7	100	88
5-21	12/5/80	1440	Wheat	179	114	8.9	10	15.7	8.9	100	89
	12/6/80	1856	Wheat	260	161	10.9*	12.6	15.4	10.9	100	87
	12/7/80	1982	Wheat	187.5	---	14.9	14.9	17.9	14.9	---	---
	12/8/80	1391	Wheat	167	114	6.8	11.9	14.6	6.8	100	57

* Estimated from soil moisture data.

** Depth stored = field capacity - before irrigation soil moisture content.

At the meeting the aims of the Project and the farmers' duties towards the Project were discussed. A map for Meska #26 was discussed with the farmers in order to show them how the new system of irrigation will be done. A road was prepared along Abeuha canal in order to transport soil for the construction work on Meska #26. An engineering design of Meska #26 as a pilot project was prepared. Vents were designed with pipes and pipe gates on two sides of the meska.

Two farms were selected on Meska #7 for demonstrating:

1. Long furrows, 90 cm apart.
2. Long furrows, 60 cm apart.
3. Long level basin.

Each of these practices were compared with the farmers' traditional system of small basins and narrow furrows. These fields were leveled to dead level. Efficiency was improved and the amount of labor needed was reduced. Complete records are being kept regarding time spent leveling, plant population, fertilizers applied and water application. Soil is sampled before and after irrigation to determine application efficiency. This information will be evaluated to compare alternative irrigation systems.

A design was prepared for Meska #22 for an earth section in the first reach and the lined section for the second reach from the belt to the drain. If this system is put into operation it is expected it will prevent seepage from the Meska to the adjacent land.

A design was also developed for Meska #13 including lining and establishment of vents with water-tight gates.

Seepage wells were installed by Meska #13 and #22 for further observation.

The floor of the Abeuha canal flume was re-established at the correct level (40.29). The flume is now working well.

Nine farms have been selected on Meskas #14, #22, and #26 in order to obtain information on the quantity of water applied to the different crops. These data will be useful for water budget analysis. Routine work continues on measuring water level in Abeuha Canal, the drains, and water table.

The Engineer of the Irrigation Department of El Minya developed plans for the Abeuha canal and the thirty meskas. This work will be done during the winter closure.

Cotton yields were analyzed on Meskas #5, #13, and #30 to determine the effect of spraying with zinc sulphate.

Farm records were summarized for nine farms for the 1980 crop year. Farm plans were prepared for each farm for the coming year. Six additional farmers were selected on Meska #26 for record keeping and economic evaluation of the Pilot Project. The final data for the farms producing sugar cane have been collected and a complete crop enterprise will be prepared in January.

Agronomist Abdel Sattar left the Project in Mid-November. Sociologist Abdallah Saber is on academic training in the United States. Sociologist Mohamed Refaat has been assigned to the Project on a part-time basis. Engineer Ahmed, and Agronomist Salah will take English language training February 2 - March 3.

Main Office Accomplishments

Engineering Discipline

1. Reviewed and/or assisted with work plans to implement the various pilot projects.
2. Assisted with arrangements to clean the drains in Kafr El Sheikh.
3. Assisted with land leveling and first irrigation on selected sites in Mansouria and Abeuha. The Mansouria sites were planted to wheat in level and graded borders, while the Abeuha sites were planted to beans in level furrows.
4. Revised the staff paper entitled, "Rotation System or Continuous Flow System for Irrigation Canals in Egypt." The revised version has not yet been released.
5. Made a series of preliminary designs for elevating Meska No. 10, Beni Magdoul.
6. Assisted with the analysis of water budget data, methods of measurement and plans for obtaining additional data in El Hammami, Kafr El Sheikh, and Abeuha. A preliminary water budget for El Hammami was completed.
7. Assisted with the redesign and reconstruction of the Abeuha measuring flume.
8. Assisted with and/or reviewed the designs and plans for improving three meskas in Abueha, including meskas #26, #22, and #13. A vertical centrifugal pump, with a belt drive from a diesel engine, was selected for Meska #26.

9. Continued to support activities of the Mansouria team in preparing for the installation of the El Hammami pipeline.

10. Prepared plans to test some new lay-flat flexible plastic pipe in Mansouria.

11. Designed a new style of lift-off box cover for water level recorders.

12. Assisted some EWUP Engineers and Agronomists in the preparation of thesis proposals.

13. Assisted with the installation and use of tensiometers for scheduling irrigations in pilot areas.

14. The preliminary water budget estimate for El Hammami suggested that outflow exceeds inflow by 19%. Estimated inflow totaled 6,082,000 m³ during 1979, while estimated outflow was 7,263,000 m³ minus 48,000 m³ change in storage. Seepage directly from the Mansouria Canal was not included in this computation. If an estimate of seepage loss from the Mansouria (EWUP Technical Report No. 3) made during three days of 1978 were to be applied (0.17 m³/km/s), the contribution from seepage would be of the same order of magnitude as the total measured inflow. The Mansouria borders El Hammami for about 2.7 km.

15. An intake problem occurred on the leveled wheat field (dead level) in Beni Magdoul. Measured application during the first irrigation, at planting, was only about 8 cm, but water stood in the low places (3 cm tolerance) nearly a week. Germination was delayed in the wet spots and, even after reseeding portions, the stand is not uniform. By contrast, a graded border operated by the same farmer (about 10 cm per 100 m) has a more uniform stand. By the second irrigation the farmer had learned to irrigate it without excess ponding or runoff at the lower end. Before this irrigation the soil had developed surface cracks which caused a high initial intake rate, but after only three or four hours the recession of water still standing on the surface of the level borders appeared to be only by evaporation. Tentative conclusions are that graded borders are better than level borders for wheat in Beni Magdoul because they experience more uniform germination and because smaller applications are possible if the water is shut off at the right time.

Economics Discipline

1. Modified the farm record book, printed the English and Arabic copies and started working on it for the year 1980/81.
2. Completed work on farm plans for the year 1980/81 at El Minya and Mansouria areas.
3. Completed farm records summary for the year 1979/80 at the three sites.
4. Worked with the committees and the team members on the Pilot Projects in the three areas.
5. Participated in the economics process of the pipeline at El Hammami area.
6. Prepared a report for evaluating the benefits and costs of the pipeline system at El Hammami.
7. Developed a complete draft report of the farm record analysis which was started at the States.
8. Melvin Skold conducted a workshop on Techniques for Economic Feasibility Analysis and Economic Evaluation of the Pilot Programs.
9. Haider completed the farm management survey at Kafr El Sheikh.

Agronomy Discipline

1. Organized initial pilot programs at all sites concentrating on winter crops.
2. Established winter crops at all locations, mostly wheat with some broad-beans and flax.
3. Completed analysis of soil fertility survey samples (all EWUP sites). Maps were also drawn to show soil sampling locations in the studied areas.
4. Papers and Reports:
 - a. Staff paper on root penetration emphasizing most roots in upper 20-30 cm regardless of water table condition.
 - b. Response of wheat to zinc foliar spray with respect to time of application.
 - c. Policy statement on use of EWUP machinery and general restriction to its use in pilot programs.

Sociology Discipline

1. Research Studies:

Evaluation of the summer field trials by the farmers in Kafr El Sheikh - Staff Report #54.

Evaluation of the summer field trials by the farmers in Mansouria - Data collection being completed.

General study on the cooperatives in Kafr El Sheikh - Draft report being written.

Prepared report entitled: "Crop Spraying in the Private Sector at Mansouria," by Mohamed Naguib.

Mohamed Naguib contributed to the Sweet Corn evaluation report for Mansouria.

2. Extension Work:

Involved in introducing the pilot projects to the farmers at each site and responsible for the continual working relations with those farmers.

Farouk Abdel Al (Mansouria Sociologist) worked with the construction of the drain on Meska #6, Beni Magdoul.

Met with the farmers on the Om'Sen Canal in Kafr El Sheikh to re-introduce our work into the area.

3. Farmer Organization:

Initiated efforts to organize farmers for the scheduling of water on Meska #26 - El Minya.

Studied existing farmer organizational development in Meska #10, Mansouria and at Kafr El Sheikh.

BACKSTOPPING

Planning and Coordinating Committee

The Mid-Project Report was completed and distributed in October.

The El Hammami buried pipeline design and specifications were completed and sent to Cairo in October.

Mr. Eldon Hanson and Mr. Tim Gates, prospective field staff Agricultural Engineers were briefed on project activities and spent part of the quarter TDY in Egypt. Mr. Hanson also was sent to Utah State University to work with Kern Stutler on land leveling. Stutler had planned to return to Cairo to help in land leveling training but change of duties at Utah State University prevented him from going. Mr. Hanson will assume these responsibilities.

Recruitment of an Economist for Field Staff Senior Economist continued. Ten Economists applied and three were selected for interviews in January.

Saad Mansour, Administrative Assistant, Cairo spent October 17 to October 29 in Fort Collins working on coordination of administration between Cairo, Fort Collins and CID office in Tucson. Mrs. Rein, Administrative Assistant, Fort Collins spent December 3 to December 13 in Cairo working.

TDY's

Dr. Parviz Soltanpour, Soil Agronomist, (October 6, 1980 - October 29, 1980); worked on soil fertility studies and fertility report for Kafr El Sheikh and El Minya. Returned early due to his wife's illness.

Mr. William O. Ree, Agricultural Engineer, (September 1, 1980 - November 30, 1980); continued on water budget studies and helped on design of Meska 10 in Mansouria and other miscellaneous duties such as placing of floor in measuring flum in Abueha canal.

Mr. Eldon G. Hanson, Agricultural Engineer, (October 11, 1980 - November 27, 1980); helped in engineering and training crew at El Minya to do land leveling and laid out 60 cm and 90 cm furrow trials in El Minya.

Dr. Melvin D. Skold, Economist, (November 19, 1980 - December 15, 1980); helped Economics team in analysis data and the economic feasibility study of El Hammami pipeline.

Dr. E. V. Richardson, Project Coordinator, (October 25, 1980 - November 22, 1980); helped administration in changeover in Directors and took part in Mid Project Review.

Ms. Dorothy A. Rein, Administrative Assistant, (December 3, 1980 - December 13, 1980); help in administrative details and coordinate administrative work between campus backstopping and Project office.

Mr. Mohammed Haider, Research Associate Economics, (December 8, 1980 - February 13, 1981 (approximate date)); to help in analysis of economic data and particularly the conducting of socio-economic survey with farmers i.. Kafr El Sheikh and Mansouria.

Mr. Rex Campbell, Communication Consultant, (October 28, 1980 - December 1, 1980); Mr. Campbell was paid local per diem only. He conducted management communication training in decision making at all three field sites.

Mr. Timothy K. Gates, Research Associate in Agricultural Engineering, (December 5, 1980 - December 22, 1980); helped in water budget studies and engineering in three sites. Made preparation for moving to Egypt in January.

Training

A. On-Farm Water Management Short Course

Dr. Redgrave using graduate students revised the training manual in light of experience gained from using it last summer. Also, planning and preparations were made for putting on the course next summer in Egypt. Egyptian project personnel will have primary trainer responsibility with Americans backstopping them.

B. Participant Training

The four Egyptians on participate training successfully completed the fall semester. Their courses and grades follow:

Mr. Wadie Fahim, Engineer

M 531 Applied Mathematics	B
AE 535 Surface Irrigation Systems	
AE 538 Groundwater Hydrology	A
GS 670 Interdisciplinary Agricultural Development	B
CS 150 Computer (Introduction to FORTRAN Programming)	B

Mr. Lotfy Nasr, Economist

EA 405 Agricultural Production Management	B
GS 670 Interdisciplinary Agricultural Development	B
EC 342 Economic Analysis of Water Resource Development	
EA 695V Independent Study	
EC 506 Microeconomic Analysis	Audit

Mr. Moheb Semaika, Agronomist

AG 650 Plant Nutrition	B
GS 670 Interdisciplinary Agricultural Development	B
AG 655 Soil Chemistry	Audit
AG 565 Soil Mineralogy	Audit
ST 301 Statistics	C

Mr. Abdallah Saber, Sociologist

S 231 Sociology of Rural Life	
GS 670 Interdisciplinary Agricultural Development	
S 331 Community Development	
S 695 Independent Study	

English Course

Mr. Saber took intensive English along with his course work. All his instructors say that his English has improved and recommend that he be allowed to stay the spring term. He will take the TOEFL in January.

All participants attended the 2nd National Irrigation Symposium in Lincoln, Nebraska, October 20 - 23. Dr. Mona El Kady also attended from Cairo.

Plans were made for three of the participants to attend an irrigation training program in Fresno, California during the winter break. Mr. Saber chose not to go in order to concentrate on his English.

C. Salt River Project Exchange Program

President Karl Abel, Vice President John Lassen, Assistant General Manager Reid Teeples, Special Program Leader Ed Kirdar and Manager of Water Resources and Services Mr. Dick Juetten visited Egypt September 24 to October 3, 1980 to arrange for an exchange program between the Ministry of Irrigation and the Salt River Project. A draft agreement and budget (in appendix) was prepared during their visit. Ed Kirdar will return next quarter to finalize plans.

Water Management Alternatives

Dr. Robert King, Niel Biggs, Deanna Durnford, Dr. Mohan Reddy, Dr. Jim Loftis, Dr. Wayne Clyma and Dr. Podmore continued their work on the computer model to test Water Management Alternatives. Dr. Clyma has learned of some work being done in Idaho and will arrange under his Water Management Synthesis project to incorporate it into our study.

Water Budget

Drs. Sunada, Ruff and Richardson worked on the Water Budget studies with Mr. Ree and Eng. Wadie Mankarious. Plans were made for Mr. Ree to return to Cairo in March and Dr. Sunada to return to Cairo in February. Eng. Wadie Mankarious has been named main office coordinator of the Water Budget studies.

Equipment

Requests for equipment were processed. Specifications for pumps, valves, etc., for El Hammami pipeline were prepared for bids.

Scope Team

The Scope Team report written by James Stephenson, Clarence Kuiper, Don Weesner, Floyd Dominy and Dick McConnen was final typed and distributed.

WORK PLANS

I. January 1, 1981 to June 30, 1981

A. Cairo

Mansouria

Construction on El Hammami pipeline will begin in February. The contractors have estimated 6-12 months for the completion of this pipeline system. Construction will also begin on Meska #10. This is an elevated meska which will use hollow concrete blocks 40 x 20 x 10 cm. They will be delivered from the factory by February 15. All financing has been approved. Construction will be by Project personnel. Completion is expected by the end of March.

Work will continue on Meska #6, Beni Magdoul, and Meska #2 at El Hammami regarding demonstrations of on-farm irrigation systems. Data will continue to be gathered. Comparison will be made between graded level borders and dead level borders.

Heavy emphasis will be given to the Sociology work at Meska #10 and El Hammami. The farmers will be involved in discussions regarding Project plans. Systems of organization will be discussed with them in order to determine how they might organize themselves for water control and maintenance of canals and drains.

See the sociology work plans following for more detail.

Kafr El Sheikh

Continue routine work associated with the on-farm pilot program. Advise farmers on irrigation and agronomic practices. Monitor and evaluate all activities.

Work planned for winter closure period:

a. Meska cleaning and maintenance by the farmers (organized with assistance of Abu Raia Co-op) on Hammad and Om'Sen Meskas.

b. The flumes at Hammad and Om'Sen meska will be closed and a pipe will be installed at each. Up and downstream continuous water stage recorders will be installed so the discharge can be monitored. This is a major step in re-establishing relations with farmers in Om'Sen water budget area.

c. The marwa at one of the Manshia area pilot sites will be rebuilt. This marwa is about 450 m and serves 18 f. There are 8 farmers who control

it. An agreement is being worked out among them to build 2 new marwas with a road in between in the location of the old road and marwa.

d. The section of Manshia meska known as "Manshia lake," where the cross section is excessive, shall be renovated (fill and pitching) and a place for watering buffalo and washing clothes and dishes installed.

Begin planning for summer season 1981 cotton crop and implement plans as season begins in February and March, i.e., site selection, land leveling, long furrow irrigation systems, agronomic practices.

El Minya

a. Constructing Meska #26 with its higher banks and vents with iron gates.

b. Organizing irrigation between the farmers according to the new system after the winter closure. We shall accompany them during irrigation and solve their problems until they become familiar with the new system and cooperate with each other in irrigating and in maintaining the meska.

c. We shall need the help of the Engineers in Minya Irrigation Department in cleaning all the meskas of Abeuha area, cleaning Abeuha canal and raising its left bank.

d. Estimating the production of sugar cane.

Main Office (January 1, 1981 - April 30, 1981)

The major effort of the main office during the next quarter will be to work with the field teams to establish Pilot Programs. The recommendation of the review team will be given careful evaluation and plans will be developed to sharpen the focus on objectives and establish strategies for achieving them.

Ten task groups will be formed. Each task group will be required to establish objectives and plans for implementation, evaluation, and reporting final recommendations. The time frame will be 2 1/2 years.

Work will continue during the next quarter on the following items:

1. Continue water budget measurements and data analysis.
2. Continue to observe if irrigations are too frequent (or too late) at times and if so, why.
3. Make more measurements of intake rate in Mansouria.
4. Continue to evaluate land leveling and associated improved irrigation practices.
5. Continue to search for a solution to the water supply and water measurement problems in Om'Sen Canal.

6. Continue searching for the best methods to decide when it is time to irrigate.
7. Continue assistance with the El Hammami pipeline, Meska #10, and Meska #26 design and/or construction.
8. Continue collecting baseline data in pilot areas.
9. Continue developing water management plans for individual farms within pilot areas.
10. Continue work on farm records analysis for the year 1978/79.
11. Start the analysis of farm management survey at Kafr El Sheikh area. Also start farm management surveys at El Minya and Mansouria.
12. Modify crop enterprise reports for 1980 prices.
13. Monitor progress of winter crops.
14. Analyze data from summer crops.
15. Conduct insect school.
16. Advance soil characterization work by determining soil irrigation management classes.
17. Comprehensive survey of winter crop root penetration.
18. Prepare papers on:
 - a. Guidelines on Pilot Program implementation and control; agronomic perspective.
 - b. Soil fertility survey analysis of Mansouria, Kafr El Sheikh and El Minya.
19. Prepare a proposal for development of soil testing program.
20. Prepare summary of field trials for cotton at Minya, cotton and rice in Kafr El Sheikh and maize in Mansouria.
21. Complete the summer field trial evaluations for Mansouria and Minya.
22. Complete the General Cooperative studies for Kafr El Sheikh, Mansouria, and El Minya.
23. Complete diffusion studies concerning the Pilot Projects.
24. Begin specific problem oriented cooperative studies in Mansouria, Kafr El Sheikh and El Minya.
25. Initiate Implementation Plans for Evaluation of each pilot project.
26. Develop extension programs designed to diffuse the results of the Pilot Projects.

27. Continue sociology work on Meska #26, El Minya in working with and documenting the process of farmer organization.

Work Plans (April 1 - June 30, 1981)

1. Continue efforts toward pipeline installation and improved meskas.
2. Continue design and/or implementation of water management improvements to selected farm sites.
3. Continue water budget activities,
4. Work on farm records analysis 1979/80.
5. Modify crop enterprise reports for 1980/81 prices,
6. Follow up and review work on farm records for the year 1980/81.
7. Prepare on-farm management survey analysis at Mansouria and Minya sites.
8. Establish and monitor summer crops for pilot areas.
9. Complete the specific problem oriented cooperative studies in each of the field sites.
10. Initiate a study pertaining to the amount of change that occurs on a farm as a result of pilot programs.
11. Continue extension work defined in project paper.
12. Continue work and study regarding farmer organization for managing meskas and drains,

MAIN OFFICE PERSONNEL AND TDY ASSISTANCE

Tim Gates will be joining the Project early in February. He will be devoting one half time to coordinating water budget work and one half time to on-farm water management at El Minya.

E. G. Hanson will join the project as a replacement for John Wolfe in Mid-April. His work will emphasize engineering aspects of on-farm water management. He will give particular backstop assistance to the Mansouria team.

An Economist replacement for Gene Quenemoen is expected to join the project in March. At this time the individual has not been named.

It is planned to request assistance of the following people on a TDY basis.

1. W. O. Ree to work on water budget, February - April.
2. Dan Sunada to work on water budget, March.
3. A. R. Robinson to work on gates for meskas and canals, Mid-February to Mid-March.
4. Someone to continue water budget work after Ree departs.
5. If a heavy workload for land leveling builds up in all three areas some TDY assistance will be requested for early fall.
6. Dan Lattimore to work on technical journalism January.
7. Jim Mayfield assistance concerning organization of farmers, March.
8. Ed Knop to conduct a study pertaining to on-farm water management advisers, May and June.
9. Dave Freeman or Max Lowdermilk, to assist with farmer organizations and mapping strategies, June, July or August.
10. R. J. McConnen, to assist with economic evaluation of Pilot Projects, February - March.
11. Don Lybecker, to assist with revised farm records and summaries of farm records, June and July.
12. Robert Heil to assist with soil characterization reports in January.
13. Willard Schmehl to review agronomic phases of the work in April.

B. Fort Collins

Backstopping

Orientation of Mr. Eldon Hanson and Mr. Tim Gates, Agricultural Engineers will be completed. Mr. Tim Gates and family will arrive in Cairo in January and Mr. Eldon Hanson in April.

The Senior Economist will be selected and sent to Cairo TDY.

The Water Management Alternatives study will be continued.

Help will be provided Cairo in finalizing the work plans for the pilot program, program changes resulting from Mid Project review, answering question raised by Mid Project Review, water budget activities, soil classification and economic studies.

Water budget activities will continue mostly on a TDY basis.

Training

a. Revisions of the on-farm water management training manual will be completed and planning for the summer training program will be continued.

b. Three of the four Egyptians will continue in their course work. Mr. Saber will take the TOEFL and a decision will be made on whether he continues in training or returns to Egypt.

c. Salt River Project Exchange will start.

C. Personnel

Field Team

Mr. Tim Gates and Mr. Eldon Hanson, Agricultural Engineers will arrive at post. Dr. Brooks will return to Oregon State in January and Dr. John Wolfe will return to Oregon State University in April. An Economist will be hired.

TDY's

Bill Ree	Engineer
E. V. Richardson	Engineer
Mohammed Haider	Economist
Dan Sunada	Engineer
Dave Redgrave	Agronomist
Robert Heil	Agronomist
Dan Lattimore	Technical Journalism
A. R. Robinson	Engineer
Jim Mayfield	Sociologist

Ed Knop	Sociologist
Richard McConnen	Economist
Max Lowdermilk	Sociologist
Don Lybecker	Economist
Willard Schmehl	Agronomist
Parviz Soltanpour	Agronomist

APPENDIX

1. Letter of Agreement Between MOI/GOE SPR and USAID, budget attached

Letter of Agreement Between MOI/GOE

SRP and USAID

A. General

For some time the Ministry of Irrigation (MOI/GOE) through the Egyptian Water Use and Management Project (EWUP) the Salt River Project (SRP) and the United States Agency for International Development (USAID) have been in communication with each other through training program of the EWUP project. During the first training tour to the SRP in the fall of 1977 Salt River Project management had indicated an interest passing on some of the management and water scheduling techniques they had developed over the past seventy five years to MOI/Egypt. It is proposed here that an understanding between the parties concerned be signed and that the initial exchange be initiated in 1981. This exchange program will be for a two year period to coincide with the CID contract completion (PACD 12/31/82).

The purpose of the exchange program is to increase the capability of Ministry of Irrigation Staff to schedule irrigations according to crop needs, to manage the delivery of water to the farmer and to gain an understanding of modern surface irrigation techniques, farmer organizations, extension service, management and cooperation.

Salt River Project is a self-growing and unique organization in Central Arizona. The Project is composed of two separate organizations, the Water User's Association, which operates and maintains the irrigation facilities, and the Power District, which operates and maintains the electrical generating, transmission and distribution facilities. The Project is an electric and water utility, and municipality, a non-project organization, a cooperative association, and Federal Reclamation Project.

.../...

Its purpose is to serve approximately 250,000 acres (feddan) with dependable water supply for agriculture, municipal and industrial use and electric energy for Central Arizona.

B. Exchange Proposal

It is proposed that Staff from the MOI will be sent to Arizona to work on the SRP and Staff from the Salt River Project will be sent to Egypt to work in the MOI. The first exchange will be 2 staff from the MOI and 2 staff from the SRP.

The Staff from the MOI will be at the District level and from the Garbeya Governorate.

It is proposed that Mr. Ed Kirdar (SRP) spend 2 to 3 weeks with the MOI/GOE early in 1981. During this period they should visit several departments within the Ministry of Irrigation, specifically the Garbeya Governorate and identify areas where they feel that the SRP can best train and accommodate Egyptian Staff of that governorate. During this initial tour a detailed exchange program will be developed. This will include developing the criteria for selecting the MOI and SRP exchangees, developing the details of the exchange program, developing a plan of work and selecting the 1st four participants. It is proposed that the training period should be eight weeks and that a minimum of two participants at a time be sent. They will start their training with a visit to Fort Collins, Colorado then spend six week of detailed training at the SRP and one week to briefly study specific irrigation equipment, suppliers, districts or related facilities. A total of 16 MOI and 8 SRP Staff will take part in the exchange over the two year period.

.../...

C. Criteria for Selection of Exchangees

1. For selection of MOI exchangees:

- (a) Persons working at the operational level of water distribution and maintenance in the Garbeya Irrigation Directorate will be given highest priority.
- (b) They should exhibit a high level of English language proficiency (Min. of 70 on Aligu) and other communication skills.
- (c) Self motivated, high initiative.
- (d) Willing to work on-the-job with SRP office and field, including manual work. Staff which most certainly include ditch-riding, maintenance, gate operations, etc.

2. For selection of SRP exchangees:

- (a) Highly skilled in a particular operation, such as, water scheduling, canal maintenance, water operation and management, telemiting, communications, etc.
- (b) Capable and willing to travel extensively in Egypt.

D. Termination of Exchange

Any exchange, either SRP or MOI, may be terminated or program reduced for cause by the host institution. Any person and his institution will be informed of the reasons for program termination or reduction.

.../...

E. Travel and Transportation

International transportation will be furnished through the EWUP project according to USAID regulations.

Local transportation during official duty will be furnished by the respective host agency. Official visitations to other project areas which require transportation may be reimbursed. However, private transportation must be worked out between the individuals and the host agency.

F. Per Diem

Per diem will be paid by EWUP according to USAID government regulations. USAID training per diem rates will be used. Receipts for lodging must be furnished and where possible for meals. All meals must be itemized and the reimbursement request reasonable.

EWUP has a low cost housing facility (6 bedrooms, guest house apartment, one kitchen, 3 baths) where 50% of the per diem is charged for housing. SRP employees have the choice of EWUP guest house or local hotels. If deluxe class hotels are used the high per diem rate is available and lodging will be paid with a receipt. All meals must be itemized with receipt if possible.

G. Salaries

MOI/GOE and SRP are to pay salaries of their own personnel and maintain them on job status as though they were working full time.

H. Lodging and Meals

These expenses would be covered by the per diem rate paid.

I. Insurance

The exchange employees will be covered under the training compensation insurance. The payment for this insurance to be reimbursed to EWUP by USAID.

J. The Designated Coordinator/Contact Person

The following are the designated coordinator/contact persons:

SRP	Mr. Ed Kirdar	Telex 668-443	Tel. (602) 273-5472
MOI	Dr. H. Wahby	Telex 93773	Tel. 756972
USAID Cairo	Mr. Niel Dimick	Telex 93773	Tel. 28219 Ex.
EWUP Cairo	Dr. G. Quenemoen	Telex 93773	Tel. 759674
EWUP	Dr. E.V. Richardson	Telex 910-930-9000	Tel. (303) 491-8655
	Fort Collins		

K. General Provisions and AID Regulations

All participants are governed by the General Provisions of EWUP contract, AID regulations and Standard Government Travel Regulation as they relate to accountability, travel, use of medical facilities, U.S Embassy facilities, etc.

L. Termination of Program

This exchange program can be terminated by any one of the four parties (CID, USAID, SRP, MOI) by giving 30 days notice.

.../...

Proposed EWUP Budget
for Exchange Training Program

	<u>\$</u>	<u>LE</u>
<u>Egyptian Exchange (16)</u>		
Per diem (16 x \$16 x 60)	44,200	
Transportation (16 x LE 1100)		
+(16 x \$300)	4,800	17,600
Excess baggage (16 x LE 75)		1,200
Contingencies (16 x \$250)		
Insurance, meetings, etc.	<u>4,000</u>	<u> </u>
Sub Total	53,000	18,800
 <u>SRP Exchange (6)</u>		
Per diem (6 x 100) + (6 x LE 57.4 x 56)	600	19,290
Transportation (6 x LE 1100)		6,600
Excess baggage (6 x LE 75)		450
Contingencies (6 x \$300)		
Insurance, meetings, etc.	<u>1,800</u>	<u> </u>
Sub Total	<u>2,400</u>	<u>26,340</u>
TOTAL	55,400	45,140
Inflation (12% take 1.06 for 2nd year)	<u>3,300</u>	<u>2,260</u>
TOTAL	58,700	47,400

Total dollar (4) cost 126,400