

QUARTERLY REPORT

October 1, 1981 to December 31, 1981

EGYPT WATER USE AND MANAGEMENT PROJECT

Submitted by

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I. PROJECT STATUS IN EGYPT

INTRODUCTION

Implementation of pilot programs and task groups was the major focus of work during the past quarter. Major accomplishments included completion of construction on Meska 10 at Mansouria, completion of design for renovation of Abueha Canal, shift of responsibility for meska cleaning and irrigation scheduling to farmers on Meska 26 at Minya and successful redesign of on-farm irrigation systems at Kafr El Sheikh.

Considerable time during the past quarter was spent working on an "Action Plan" requested by the Minister of Irrigation. The proposed plan has been discussed by two committees in the Ministry of Irrigation and recommendations are expected at the joint meeting of the Advisory Committee and the Policy and Coordinating Committee to be held in January in Cairo.

Planning for the Joint Meeting was completed during the past quarter. The final agenda for this meeting is included in the Appendix.

Construction work is lagging somewhat on the pipeline system for El Hammami Canal. This project is targeted for completion in March 1982 but it is now almost certain to be delayed. Every effort is being made to encourage the contractor to complete the work on schedule so that planned work with farmers can be accomplished on schedule.

Considerable progress was made with publications procedures. Elizabeth Sherman joined the staff in October to work as technical editor. In addition to reviewing all project publications, she assisted with editing a number of draft working papers and several project technical papers. A detailed proposal was prepared to present for discussion and approval by the Joint Committee. If approved it is anticipated the new procedures will greatly facilitate publication and distribution of project findings.

A detailed report of pilot programs and task groups follows.

MANSOURIA

The pilot programs of Mansouria include the elevation of meska 10, forming a lined concrete structure and construction of a buried pipeline replacing the El Hammami canal.

The objectives of these structures are basically to:

1. Deliver proper quantities of water to all farmers served by the system.
2. Reduce the conveyance losses which now occur.
3. Deliver water to farmers with sufficient head to allow for faster irrigations by gravity.
4. Eliminate the need for lifting water.

I. Accomplishments and Future Plans for the El Hammami Pipeline Pilot Program are as Follows:

- A. Construction has been very slow, some pipe has been laid and the pipe stands will hopefully be constructed during the winter closure period. Currently we are awaiting colars for joining pipes before more pipe can be laid. Arrangements have been made to provide 64 rather than 16 outlets.
- B. On farm water management data are being collected on several sites. This will continue in the next quarter.
- C. The farm record data are being maintained on many sites in the area and will continue.
- D. Selected water budget data are being collected and will continue.
- E. We plan to also measure conveyance losses on the El Hammami canal in this next quarter.
- F. A survey is being conducted to determine the exact land area and farmers served by the current sakias and pumps in the area.

II. Accomplishments and Future Plans for Beni Magdoul Meska 10, Pilot Programs are as Follows:

- A. Construction of the meska is now essentially complete. It is being operated as farmers request water. Several small modifications will be made in the next quarter. These include improvement of the gates and obtaining larger discharge pumps.

- B. OFWM data continues to be collected. Additional observation wells have been installed. A report of the OFWM has been delayed. Hopefully, it will be completed soon.
- C. A survey documenting the farmers' system of irrigation scheduling on the old meska has been completed. These data will be reported this next quarter.
- D. Farmers' attitudes and problems related to the new meska are being observed daily.
- E. Farm records continue to be kept. The farm management survey is progressing well and will continue this next quarter.

III. Special Studies

- A. OFWM reports on the past wheat and corn crops have been delayed but hopefully will be completed in the next quarter. Currently the berseem crop with both conventional irrigation and long flooded basin irrigation is being evaluated. No work with wheat will be done in order to concentrate the efforts of gathering better quality irrigation data on berseem.
- B. The water budget is being continued in the Beni Magdoul area. Full details are reported by the water budget task group.
- C. The cropping sequence studies are continuing in both areas.

ADMINISTRATIVE
MANSOURIA FIELD STAFF

PROFESSIONAL

Dr. Mona El Kady	Team Leader	Bill Braunworth	Assistant Team Leader
Eng. Eldon Hanson	(one half time)	Moheb Semaika	Agronomist
Wadie Fahim	Engineer	(one-third time)	
Shinnawy A. Atty	Economist	Mohamed Naguib	Sociology
Ahmed Tahoon	Agronomist	Sabah Mahmoud	Agronomist
Forouk Abdel Al	Sociologist	Hanafy Mahmoud	Engineer
Camal Fawzy	Economist	Mahmoud Khedr	Agronomist
Kalid	Engineer	Tarik Abdel Rahman	Agronomist
Tarif Zeiton	Engineer	Ahmed Taha	Mech. Engineer

NONPROFESSIONAL

Badry Mahmoud	S. Tech.	Hamdy El Said	S. Tech.
Ibrahim Hussein	S. Tech.	Gamal Ahmed	S. Tech.
Rokaya Abdel Mowla	Secretary	Ibrahim Abdou	S. Tech.
El Said Kamal	S. Tech.	Ibrahim Zakaria	S. Tech.
Moustafa Mahmoud	S. Tech.	Said Rezk	S. Tech.
Mohamed Abdel Hamid	S. Tech.	Abdel Abdel Moniem	S. Tech.
El Said Hamed	S. Tech.	Ibrahim Abdel Fattah	S. Tech.
Mohamed Farrag	S. Tech.	Mohamed El Dash	S. Tech.
Mohamed Shaaban	J. Tech.	Esmail El Shimi	J. Tech.
Abdel Rahman Eid	J. Tech.	Abdel Rehim Mohamed	J. Tech.
Shawky El Awad	J. Tech. Lab.	Abdel Maaboud Ibrahim	J. Tech.
Selim El Tantawy	J. Tech.	Farahat El Ashkar	J. Tech. Lab.
Fathy Aboul Nasr	J. Tech. Lab.	Hamed Aly Tahoon	J. Tech. Lab.
Ahmed Ragab	J. Tech. Lab.	El Shimi Ismail	J. Tech. Lab.

DRIVERS

Yehya Abdel Sallam	El Said Elwy
Rashad Abou Bakr	Abdel Mohsen Abdel Halim
Salah Sadek	Nagy Hassan

At a meeting with the Project Directors on August 23, the Mansouria Team reaffirmed the following staff assignments and responsibilities:

Team Leader	Dr. Mona El Kady
Team Leader Counterpart	Bill Braunworth
Assistant Team Leader	Wadie Mankarios
Manpower Coordinator (technicians, laborers, drivers)	Lotfi Nasr
Beni Magdoul Area Coordinator	Wadie Mankarios
El Hammami Area Coordinator	Samaika
Agronomy Coordinator	Samaika
Engineering Coordinator	Wadie Mankarios
Mesak #10 Pilot Program Coordinator	Tahoon
Other P.P. members	Lotfi Gamal Hammami Khalid Farouk
El Hammami Pipeline Pilot Program Coordinator	Tarik (in the absence of Naguib)
Other P.O. members	Naguib El Shinnawi Tarik Samaika
Water Budget Coordinator	Wadi Mankarios
Meska #6 Special Studies Coordinator	Mahmoud
Crop Calender Special Studies Coordinator	Sabah

Pilot program groups and discipline groups will meet once per week. The whole team will meet once per month.

Pilot program groups and special studies groups will prepare a report of progress each month and submit it to the Team Leader.

Moheb Samaika will spend four days each week in the Main Office assisting with the general EWUP agronomy work.

Hammam left the project and Kalid replaced him, also Hanafi is expected to leave.

Training Past Quarter and Plans for Future:

None

<u>TDY Assistance during Last Quarter:</u>	<u>From</u>	<u>To</u>
Dr. Robinson	Oct. 20	Nov. 29
Bill Ree	Sept. 2	Dec. 1

KAFR EL-SHEIKH

I. Summary of Progress

During the fourth quarter of 1981, work at the Kafr El-Sheikh site was concentrated on these activities:

- A. Completion of data collection and analysis for 7 pilot farms of the 1981 summer season on-farm pilot program (cotton, rice and maize).
- B. Planning and implementation of 1981-82 winter season on-farm pilot program activities. Planning for farmer-organized meska cleaning during 1982 winter closure period.
- C. Special studies.

These activities are discussed in more detail below:

- A. Yields were measured on the summer season pilot farms and other farms in Abo Raia area. Other data collection activities were completed. Data are being analyzed and summaries being prepared. Farmer opinion of the work done by EWUP on their farms was surveyed. A comprehensive summary report is under preparation and should be ready next quarter.
- B. Farms for winter season, 1981-1982 were selected. One new farm was chosen in each of Hammad and Manshia areas. On these farms the K.S. on-farm pilot practices were implemented (land leveling, dead level border or long furrow irrigation system design, system layout design, field drain elimination, marwa improvements, besides the agricultural practices, etc.). Significant on-farm conveyance system improvements were implemented on the two new farms.

In Hammad area, a new marwa was constructed with the project ditcher. After hand shaping, wetting and settling, and compacting, the marwa was lined with plastic sheeting (1.8 m wide) donated by Medical Containers Manufacturing Company, Cairo. In Manshia area, the new site is irrigated by pump. Lay-flat irrigation tubing (40-cm diameter) was attached to the pump and used to convey water to the various strips (200 m overall length). Small gates were installed in the tubing for furrow irrigation. Both of these efforts are aimed at reducing the excessive on-farm conveyance losses

measured in the past in Abo Raia. Measurements show from 10 percent to 70 percent of the total water lifted is lost before it reaches the field being irrigated. Initial farmer reaction was very good. The largest constraint to using this system will be the cost. Economic and technical feasibility analyses are integral parts of these studies and are underway.

In addition to the two new farms, one of the pilot farms from previous seasons was selected in each pilot area for continuation of measurements, etc. Land leveling was "touched up" on these sites if grid surveys indicated there was a need. Farmers were assisted with system layouts (i.e., borders, long furrows, new marwas with project ditcher, etc.). Routine on-farm measurements will therefore be made on two farms in each pilot area. For the 1981-82 winter season this represents an area of approximately 15 Feddans.

Farms have been selected in each pilot area where no work by EWUP has been done. Water will be measured on these sites for the Economics Discipline. All of the previous pilot farms will be monitored: routine contacts with these farmers will be made to check their progress, advise and check for problems, etc.

Preparations are being made for the farmer meska cleaning program during the coming winter closure period. Contacts are being made with leaders in the villages to inform them of plans and obtain their support in organizing this work. The initial 500 m reach of the Hammad meska was cleaned under K.S. team direction using a mechanical cleaner provided by the K.S. Irrigation Department.

- C. Water budget routine data collection has progressed on schedule. The delivery system study is progressing well. Contacts have been made with local officials (Irrigation Department and Cooperative) to obtain information, review the proposal and receive their opinion. Reaction to the proposal is very good so far. Meska inlet headworks (pipes and gates) are being designed. A questionnaire has been prepared for surveying farmer opinion to the proposal. Crop water requirements studies are being continued with analysis of weather data records, etc.

II. Personnel Activities:

A. EWUP KAFR EL SHEIKH PERSONNEL (as of 31 December 1981)

Kamal Ezz El Din (Eng.) Team Leader
 Thomas W. Ley (Eng.) Assistant Team Leader

(Professionals)

1. Eng. Abdel Fattah Metawie
2. Agr. Magdy Mohamed Awad
3. Soc. Ahmed El Said El Attar. (Hammad Group)
4. Eco. Magdy Badawi
5. Agr. Ahmed Ismail*

1. Eng. Saad Hussein Zaki
2. Agr. Mahmoud Mohamed Said
3. Agr. Mohamed Ibrahim Meleha (El Manshia Group)
4. Eco. Sobhi Ahmed Elewa
5. Soc. Soher Kamal Yousef
6. Eng. Amany El Kayal*
7. Eco. Mohamed Ragy Darwish*

(Technicians)

1. Mohamed Ahmed Badr
 2. Mohamed Omer Abdel Megeed
 3. Kamal Mohamed Abo Omer
 4. Helal Mohamed Hussein (Hammad)
 5. Fathi El Said Helal
 6. El Said Abdel Salam El Barbari
 7. Abdel Aziz Osman El Yamany
1. Moheb Abdel Samad El Sawey
 2. El Said Abdel Haiy Abdel Hamid
 3. Ahamed Abdel Hamid Ali (El Manshia)
 4. Alaa Fatoh Ibrahim
 5. Yousef El Said El Yamany
 6. Fikry Abdel Halim Zaid
1. Ramadam Gazal (W.B.)

(Laborers)

1. Ibrahiem Said Ahmed (Hammad)
2. Saber Ahmed Ismail
3. Abdel Raouf Mazal. (Manshia)

(Lab.)

1. Atef Hamed Said Ahmed (Technician)
2. Amal Mostafa El Shenawi (Technician)

(K.S. Office)

1. Mohamed Ahmed Abo Omer. (Administrative Assistant)
2. Nadia Mahmoud Arafa. (Secretary)
3. Ahmed Mostafa Baraka (Laborer)

(Equipment and Cars)

1. Abdel Hamid Said (Technician)
2. Mostafa Taha El Shenawi (Driver)
3. Mahmoud Mostafa El Shenawi (Driver)
4. Mohsen Abdel Razek Saad. (Driver)
5. Atia Mostafa Abdo (Driver of Tractor)

(Training Center)

1. Osman Abdel Rasool (Laborer)
2. El Said Ahmed El Felawi (Guard)
3. Mohamed Mahmoud El Mashaly (Guard)

(K.S. Store)

1. Mostafa Bassuini El Gamal. (Guard)

(Field Office Store)

1. Ibrahim Ibrahim El Tanahy (Guard)

B. Training Status:

1. Engineer Amany El Kayal is continuing Master's degree program at Utah State University under the Peace Fellowship program.
2. Agronomist Ahmed Ismail is continuing long-term academic training at Colorado State University.
3. Economist Ragy Darwish returned to Bari Institute in Bari, Italy to complete a Master's degree (December 1981).

III. Work Plans for Next Two Quarters:

- A. Data analysis will be completed and a report will be formulated and submitted to the main office covering the 1981 summer season on-farm pilot program activities.
- B. The 1981-82 winter season on-farm pilot program activities will continue with routine data collection (irrigation measurements, soil moisture measurements, water table levels, crop growth monitoring, etc. on the pilot farms). Yield measurements will be made at season's end. Results will be reported in the third quarter of 1982.
- C. Several group meetings are planned for early January with the farmers of Hammad, Om'Sen and Manshia Meskas to finalize preparations for farmer-organized and implemented meska maintenance during the winter closure period. Farmer organization efforts were begun during the winter closure period. Farmer organization efforts were begun during the months of November and December of the last quarter of 1981. Other closure period work: repair and modify water measurement structures (Helal and Om'Sen and Hammad Flumes); measure water levels in water budget observation wells daily; measure water quality in canals, wells and drains several times through the closure period.
- D. Continue routine water budget work. Emphasis will be placed on analyzing data for the period March-December, 1981 with main office water budget staff.
- E. Delivery System Study: Farmers will be surveyed after winter closure period for opinions and reactions to proposed plans for installation of control structures on each meska inlet and controlling water rotations such that meskas of the Dakalt canal is planted in rice (have a 4-4 rotation) and in cotton and maize (have a 4-12 rotation) during summer seasons. Designs of meska inlets will be completed and a preliminary budget prepared and submitted. Preliminary results of the farmer opinion survey are expected by the end of the first quarter of 1982.

F. The crop water requirements study will continue and it is possible a report will be formulated during the first two quarters of 1982.

Attachment

The K.S. team developed and completed a series of charts during the last quarter of 1981 which explain the history of work at K.S. and the important results. These are attached as an appendix to this report.

EL MINYA

A. Meska 26 Program:

1. We analyzed the water delivered to the meska during the summer season from which we obtained.
 - a. Water used for irrigation in every reach and area irrigated.
 - b. Average quantity of water used for irrigation per feddan.
 - c. Average time used for irrigation per feddan.
2. We estimated the yield for cotton and corn along the meska especially the fields sprayed by zinc sulphate. We compared them with the others which were not sprayed.
3. We selected farms for wheat and broad beans and started to measure the water applied from the beginning of the winter season.
4. The responsibility of the organization of farmers for irrigation and cleaning the meska was completely transferred to farmer leadership.
5. We leveled about 7 feddans before planting winter crops.

B. Meska 7 Program:

1. We leveled about 25 feddans served by the meska.
2. Cooperating with the farmers after harvesting summer crops we plowed, filled, compacted, and constructed half the meska in a straight line. We shall complete it during the winter closure.
3. The result of reconstructing this reach are:
 - a. The availability of water is improved for every farmer in this reach.
 - b. The increased head helped the farmers to irrigate in a short time and with better efficiency.

C. Abueha Canal:

1. The Survey Department determined the legal boundary of the canal.
2. We finished the survey of the actual stream and established a baseline and the legal boundary.
3. We surveyed the cross sections from the inlet until the end.

4. Engineer Tim Gates finished the design of the Abueha Canal and discussed it in different meetings in the main office.
5. We agreed about the final design to complete the cross section with two banks and made the estimated cost needed for constructing the canal during winter closure.
6. The Irrigation Department gave order to construct an iron gate at the intake to replace the wooden blocks.

D. Special Activities:

1. We started to organize farmers on the other meskas which we plan to reconstruct as meska 7.
2. We took water samples from Ibrahimiya Canal, drain, three observation wells at the beginning, the middle and at the end of the area every month and we sent it to the laboratory in Cairo to be analyzed.
3. We continue to do our daily work on:
 - a. Water budget.
 - b. Recording observation wells, boundary wells and seepage wells.
 - c. Taking soil samples before and after irrigation on the selected study farms.

E. Plans for Next Quarter:

1. Complete the construction of Abueha Canal according to the new design.
2. Complete the construction of meska 7 and one or two of the other meskas.
3. Continue to organize the farmers on the other meskas.
4. Level land on farms selected for summer research trials.

F. Names and Contributions of Professional Staff During Past Quarter:

1. Minya Field Staff:

Abdel Raouf	Water budget, water management field trials, information for Abueha design, survey for land leveling.
Ahmed Abdel Nahim	
Tim Gates (one-half time)	
Mohamed Awad	Agronomy practices, soil samples, complete the estimation of the summer crop yield.
Salah Saleh	

Abdalla Saber	Organization of the farmers on meska 7 and started on the other measkas (U. 11, 13 and 22).
Nabil Farag	Farm records, farm plans and economic evaluation.
Dr. Nielsen	Shares in the Abueha Canal design, land leveling on meskas 7 and 26.

2. Main Office Discipline Leaders and TDY Assistance:

Eng. Abdel Hamid	Studying Abueha Canal design.
Eng. Ahmed Maher	Studying other maskas design.
Eng. Tim K. Gates	Planning of Abueha Canal construction and evaluation of water budget.
Eng. Eldon Hanson	
Dr. Hamid Saleh	Plan for winter crops and agronomy practices for the whole area.
Dr. R. Tinsley	
Mr. Farouk Abdel Al	Economic evaluation of crops.
Mr. D. Martella	Plans for farm management with the farmers for the whole area.
Mr. R. Rehnberg	
Dr. M. Sallam	Work to establish the local farmer organization for the whole area.
Dr. J. Layton	

G. Training Status for Minya Professional Staff during Past Quarter:

Eng. Esmat Wafik:	Academic Training
Eco. Elia Sorial:	Academic Training

TASK GROUP 1 - ON-FARM IRRIGATION

The activities of this task group pertain to objectives of increasing the water use efficiency on farms by:

1. Developing criteria to guide farmers in applying water with appropriate frequencies and amounts of water to favor good soil moisture conditions and crop yields.
2. Minimizing excess water application to improve drainage conditions.
3. Helping farmers to organize in a mutual effort to improve their water management practices.
4. Evaluating the benefit-cost ratio of changes in delivery systems of selected meskas.

Water Application: On-Farm Water Management (OFWM)

1. OFWM activities have been continued to measure water applied to farms and stored in the soil at sites selected in previous periods to compare water application efficiencies in long runs with those measured in conventional small basins.

A.R. Robinson working with the Mansouria staff had two Egyptian Irrigation Pipe Outlets (EPO) constructed. One was installed and calibrated at Meska 10. This outlet appears to have considerable utility for measuring water from elevated meskas which have adequate head available.

Sterling Davis working with Mansouria staff has made preliminary evaluation of soil sampling procedures to identify reasons for water application efficiencies being reported in excess of 100 percent. Considerable improvement in data has been observed near the end of this quarter. The main effort on this subject will be made during Mr. Davis' TDY duty in January, 1982.

2. Water table depths have been measured on a continuing basis in observation wells established previously.

Sociological:

1. Sociological evaluation: a sociological evaluation on the on-farm practices in Kafr El Sheikh and Mansouria has been completed after each season.

2. Observation of pilot program activities: documentation of how the pilot programs in each area are being implemented is being performed.
3. Observation of relationship surrounding the tasks among the farmers, and between the farmer and EWUP: same answer as (#2).
4. Seasonal sociological evaluation of EWUP farm practices: same answer as (#1).
5. Meska 26 farmers have been organized and we are continually documenting the progress of that organization. Also organized farmers on Meska 7, El Minya; Meska 10 in Mansouria, and in the Kafr El Sheikh field sites.

Plans for Next Quarter

Water use efficiencies will continue to be measured and evaluated and the water table positions will be monitored.

Special evaluations will be by Sterling Davis to determine sources of errors that have resulted in application efficiencies in excess of 100 percent.

Sociological observations will continue to document the various pilot program activities relating to this task group and the farmer organization aspects.

John Wolfe will evaluate and write-up El Minya on-farm water management data collected by Esmat who is in U.S.A.

Future Work Involving TDY Personnel Will Be:

1. Evaluation of water quality for irrigation (Scott - in cooperation with task group 10 activities).
2. Study of aquifer properties of all three team areas to determine vertical and lateral ground water flows (GW Specialist).

Personnel Presently Assigned to the Task Group

Maher, Hanson, Azza, Martella, Sallam, Taher, Farouk and Nadia.

TASK GROUP 2 - WATER DISTRIBUTION SYSTEMS

Task Group 2 objectives pertain to increasing the conveyance efficiency of irrigation channels and to improving gravity flow conditions from canals and meskas to land during all levels of irrigation requirements throughout the seasons. This involves using elevated meskas or pressure pipelines to provide more irrigation head and having appropriate weed control measures and/or lining to minimize head loss and seepage during conveyance. Scheduling, rotation, continuous flow, etc. and also influence channel size maintenance work, time opportunity for seepage, costs, and organizational problems with farmers. The evaluation of these variables for practical and economic solution is the overall objective of this task group.

Activities

Hydraulic design work for raising the Abueha Canal has been completed using the computer program which was developed and reported on in the last quarterly report. Canal cross sections were drawn and required quantities of earth work were computed. A contractor has been engaged and work is expected to begin early in January 1982.

The upper half of Meska 7 (El Minya) was rebuilt at a higher elevation which has greatly improved the head for delivery of water for irrigation.

Meska 10 (Mansouria) has been completed. A temporary pump has been installed and will be used until final arrangements can be made for the installation of the design pump. Some turnout gate leakage and channel seepage has been observed and noted for repair work during January closure.

Construction of the El Hammami project has been limited to the north pipeline which is only half completed. The slow progress is attributed to a lack of a qualified contractor.

At Kafr El Sheikh (Hammad area) plastic lining in a new marwa has been placed for evaluation of benefits from reduction of seepage losses and weed control costs.

At another new site (Manshia area) lay-flat plastic tubing (40 cm diameter with gates) was used to convey water directly from the pump to the furrows to eliminate conveyance losses which in the past have been measured in some areas to be as high as 70 percent of the water pumped.

A procedure was outlined with A. R. Robinson for making a seepage test by the ponding method of El Hammami Canal. Soil has been stock piled near sites where earth dams will be placed in the canal to make the test when January closure commences.

Plans for Next Quarter and the Future

Abueha Canal construction will commence early in 1982. It is expected that the construction work will continue throughout a considerable part of 1982 with gated vents being installed in the latter part of the year during closure periods. The gates for the vents are to be manufactured in Egypt. A gate has been obtained from the Waterman Company in U.S.A. for use as a model for local manufacturing.

During January closure, Meska 7 will be completed. Only the upper half has been elevated. Plans will be made to raise other meskas at a later time during 1982.

El Hammami pipeline work will continue and administrative pressure will be exerted to have the construction company expedite completion early in 1982.

Seepage tests in the El Hammami Canal will be completed during the next quarter using the ponding method. Results of the canal seepage tests will be used to evaluate benefits of the pipeline which should have negligible conveyance seepage losses. Similar seepage tests are also planned for the lined Meska 10 and the unlined Meska 10.

Control structures at Kafr El Sheikh are proposed for installation in each of the two pilot progarm meskas. Construction apparently will depend on results of a survey asking opinions of farmers about using control structures. The survey results are expected to be available in March, 1982.

Personnel Presently Assigned to the Task Group

Tahim, Hanson, Gates, Gamal, Tinsley, and Layton.

TASK GROUP 3 - FARMER ORGANIZATION

The following report will detail the responsibilities, activities, and administration of Task Group 3: Farmer Organization. To begin with, the objectives of the task group will be presented which will then be followed by the activities pursued by the task group members. Finally, the plans for the future, including personnel, will be delineated.

Objectives of Task Group 3:

1. To define the purpose and nature of a farmer organization. What must be accomplished through this objective is that an understanding must be developed in terms of what the project means by a farmer organization. Parameters involving tasks, procedures, structure, integration with other aspects of the farmer community and government, etc., must be delineated in order to determine what is to be considered when developing various types of farmer organization for particular purposes.

2. To examine the existing organization capabilities of the farmers.

In order to begin to develop strategies for organizing farmers, it is wise to understand the existing social arrangements which already form some type of organizational pattern within the community. Formal organizational efforts can be greatly facilitated if they are developed in harmony with existing patterns of leadership, authority, purpose, interaction, etc. What is to be done in accomplishing this objective is to describe existing patterns of organization by which the farmers pursue various agricultural/irrigation activities.

3. To develop and analyze strategies for the implementation of specific farmer organization.

Through the various pilot projects, different types of farmer organizations will be established. Strategies as to how these organizations are related and sustained will be documented as they are planned.

4. To analyze the procedures and administrative structure encompassing the farmer organizations at the specific field sites.

After each organization is established, the processes at work to institutionalize that organization will be documented as they develop over time. The processes which will be examined are included in the general categories of procedures followed in theory, structure of the organization, personnel in the organization, and interaction of the organization with other institutional entities, i.e., EWUP, the MOI, etc.

Tasks Completed:

The tasks of Task Group 3 involve three major forms of activity: (1) the actual development and sustaining of various farm organizations, (2) the documentation of this process, and (3) the documentation of the existing situation of which the organization is part. Activity 1 is designed to accomplish objective 3 while activity 2 is designed to complete objective 4. Activity 3 is matched with objectives 1 and 2.

Developing and Sustaining Farmer Organization:

1. Minya - Meska 26

During this quarter the administration of the scheduling, and the cleaning and maintenance of the meska was performed by the farmers themselves. Project personnel informed the meska leadership of the on-period times, and the scheduling format was set up by the meska leadership. The routine for scheduling irrigation and the cleaning and maintenance program are becoming routinized in the farmers' schedule.

2. Minya - Meska 7

A meska organization was developed along with the meska improvement. Once the whole meska is completely reconstructed, the organization will be used to schedule irrigations. Now this organization is being used to help construct the meska.

3. Minya - Abueha Canal

Initial leadership contacts along the canal have been made to inform the farmers about the work to begin during the closure period. A procedure for developing organizations along each meska has been established and is ready to be implemented.

4. Mansouria - Meska 10

Contact with the farmers is continuing as the meska is being improved.

5. Mansouri - El Hammami

Organizational work is being correlated with the actual construction work being accomplished on the pipeline.

6. Kafr El Sheikh

Farmers along the Om Sen, Manshia, and Hamed Canals have been organized for the upcoming cleaning program and are ready to perform the work during the 1982 closure period.

Documentation of Farmer Organization Work: (Accumulated Work through this Quarter)

The documentation of the organizational work will follow the six major procedural steps in organizing farmers: (1) identifying the local leadership, (2) contacting that leadership, (3) contacting the farmers, (4) establishing the organization, (5) sustaining the organization, (6) evaluating the organization. All documentation will result from interviews and observation studies.

1. Accumulated leadership studies (complete for Meska 10, Hammami (Mansouria); Meska 26, Meska 7 (Minya); Meska 11 (Minya); Om Sen Canal, Hamed Canal, Manshia Canal (KES)).
2. Contacting leadership (same as 1 except for Meska 11. Also contacted Abueha Canal leadership).
3. Contacting farmers (same as 1 except for Meska 11).
4. Establishing the organization:
 - a. Creating the structure of the organization (complete Meska 26, Meska 7, Om Sen, Hamed, Manshia).
 - b. Naming the personnel for the organization (complete Meska 26, Meska 7, Om Sen, Hamed, Manshia).
 - c. Establishing working procedures for the organization (complete Meska 26, Meska 7, Om Sen, Hamed, Manshia).
5. Sustaining the organization:
 - a. EWUP interaction (in process for all areas). Documenting how EWUP works with the farmers in the particular organizations.

- b. Disengagement of EWUP. Documented how EWUP relinquished administration of Meska 26 scheduling to the farmers and its results.
- 6. Evaluating the organization (to be accomplished in future).
 - a. Achieving its stated goals. (Initial evaluation of Meska 26 completed).
 - b. Performance under the existing structure. (Initial evaluation of Meska 26 completed).
 - c. Performance under the existing procedures. (Initial evaluation of Meska 26 completed).

Documentation of the Existing Situation:

Efforts for this topic are focused on looking at how the farmers presently work together for particular practices and how other organizations (i.e., the Cooperative and MOI) affect the farmers' activities.

- 1. Minya
 - a. Completion of tenure map for Abueha Canal.
- 2. Mansouria
 - a. Completion of tenure map for Meska 10 and finishing the work for the Hammami Area.
 - b. Examining how the farmers are adjusting to the new structure on Meska 10.
- 3. Kafr El Sheikh
 - a. Completion of tenure map for Om Sen, Hamed, and Manshia areas.

Tasks being Worked on Now and Future Plans:

The tasks being worked on now and for the next quarter will follow the past quarter's work. Present organizations established will be studied as to how they are sustained and evaluated; while other organizations which need to be established will be created. Again, documentation of these organizational efforts from the outline previously presented will be of top priority.

Developing and Sustaining Farmer Organization:

- 1. Minya
 - a. Work to make Meska 26 and Meska 7 organizations more functional.

- b. Work on developing farmer organizations on all meskas in Abueha to begin during closure period.
 - c. Work on establishing a canal wide organization.
2. Mansouria
- a. Work to make Meska 10 scheduling a viable program through farmer cooperation.
 - b. Work to develop farmer organization for the Hammami pipeline.
 - c. Initiate sakia unit scheduling program.
3. Kafr El Sheikh
- a. Evaluate organizational efforts for cleaning and maintaining Om Sen, Hamed, and Manshia Canals for the next closure period.
 - b. Being evaluative study on the farmer perceptions of the delivery system program.

Documentation of Farmer Organization Work:

Work on completing the outline points for establishing farmer organizations.

Documentation of Existing Situation:

Continue to develop a program to obtain data on criteria necessary for the establishment and the sustaining of farmer organizations.

Administration:

The names of the personnel presently assigned to Task Group 3 are as follows:

- 1. Mohamed Sallam - Coordinator
- 2. Jim Layton
- 3. Farouk Abdel Al
- 4. Eldon Hanson

There has been no TDY support this past quarter. The next scheduled TDY will be Dr. Frank Santopolo for this summer.

TASK GROUP 4 - FARM MANAGEMENT AND PLANNING

Task Group 4 was reorganized and the new name, "Farm Management and Planning" was effective starting from October 1, 1981. Farouk Abdel Al continued as Coordinator. Other members are: Dick Tinsley, Mohamed Sallam, Dave Martella and Abdel Hamid Fahim.

I. Progress of Work for Past Quarter

- A. Prepared a data book for Abueha Canal and Meska 26.
Completed 1980-81 farm record summary.
Completed farm management survey on Meska 7 and Meska 26 at Minya.
Completed farm management survey on Meska 10 at Bani Magdoul.
- B. Worked on baseline data for Mansouria site.
Worked on crop calendar, average inputs and outputs per feddan for main crops at the three sites.
Worked on F.M.S. tabulation for El Hammamy area.
- C. Work Not Completed
Baseline data for Mansouria and Abu-Raia Sites.
Economics evaluation for Meska 7 at Minya.

II. Plans for Next Quarter

- A. Work on 1980-81 farm record analysis for the three sites.
Work on economic evaluation for Meska 7 and Abueha Canal construction.
Work on baseline data for Mansouria site.
Complete F.M.S. analysis at El Hammami; Meska 10 at Bani Magdoul; and Meska 7 and Meska 26 at Minya.
Work on developing alternative irrigation schedules and sequencing from the evaluation of farm record data.
Complete crop calendar, average inputs and outputs per feddan for the main crops at the three sites.
- B. TDY Assistance
Melvin Skold, Dick McConnen and Rex Rehnberg assisted with task group work during the past quarter.

III. Names of Personnel Presently Assigned to the Task Group

Farouk, Tinsley, Sallam, Martella, Fahim.

TASK GROUP 5 - THE WATER BUDGET

Activities and Progress this Quarter

Monitored and assisted with routine data collection at each of the project sites.

Completed a preliminary report of the 1980 water budget for Beni Magdoul.

Completed a preliminary 1980 water budget for Abueha.

Began analysis of 1981 inflow data for Om Sen.

Plans for Next Quarter

Continue to monitor and improve data collection at each of the project sites.

Establish and maintain routine sampling for water salinity at Beni Magdoul and Abueha.

Collect deep core soil samples at Beni Magdoul for analysis of aquifer properties.

Prepared an implementation plan for determining the nature and degree of deep percolation in the Beni Magdoul and Abueha areas.

Prepare a preliminary 1981 water budget for Om Sen.

Begin analysis of 1981 inflow data for Beni Magdoul.

Suggested Modifications Including Additional Resources Needed for Implementing Long Range Plans

An additional engineer is needed in Kafr El Sheikh to coordinate data collection for the water budget. It is recommended that someone be hired immediately in order that he might receive training and orientation from Eng. T. Ley who is presently coordinating the water budget.

With the absence of Eng. Azza, we have needed a full-time assistant to help us with storage of water budget data on the computer.

Names and Contributions of Professional Staff during this Quarter

Main Office Staff:

M. Helal - engineering, computer programming, management.

Azza Nasr - in U.S. for training until May, 1982.

T. K. Gates - engineering, management.

Field Staff:

Ahmed Abdel Nahim - water budget coordination, Abueha.

Wadie Fahim - water budget coordination, Mansouria.

T. W. Ley - water budget coordination, Om Sen.

TDY:

W. O. Ree (departed December 2) - engineering.

Personnel Presently Assigned

M. Helal, T. K. Gates, Azza Nasr.

TASK GROUP 6 - LAND LEVELING

Objectives:

1. Collect and analyze all information on land leveling done by EWUP in the three work areas.
2. Summarize the present land leveling activities of the farmer, including those which increase the surface variation, and evaluate his acceptance of new standards and practices.
3. Analyze the costs and benefits of precision land leveling. Show which part of the cost was born by EWUP, and what part of the benefit was from labor saving, etc.
4. Assess the impact of leveling on-farm water management.
5. Establish training for farmers who wish to improve their own land leveling skills.

Land leveling and/or planning was accomplished on 40 feddans at El Minya, 10 feddans at Mansouria, and 32 feddans at Kafr El Sheikh.

Meetings were held at each site to train tractor operators in land leveling and in the adjustment of scrapers and land planes for effective operation. Team members measured yield from leveled and unleveled sites. They also determined irrigation requiremenets for both leveled and unleveled areas to provide information for evaluating the benefits of land leveling.

Assistance was given in mounding soil and construction of elevated meskas at El Minya and Kafr El Sheikh.

Personnel Presently Assigned to the Task Group:

Bayoumi, Hanson, Gamal and Sallam.

TASK GROUP 7 - SOIL FERTILITY

Objectives:

1. To determine present level of nutrients in soils of the three project sites.
2. To determine variability of soil fertility within each hod (large basin).
3. To determine variability of soil fertility between hods.
4. To study the feasibility of soil testing for the purpose of making recommendations.
5. To utilize soil fertility data to improve Egyptian agriculture.

Tasks Completed:

All work of this task group is now completed. Dr. Parvis Soltanpour made a TDY visit to the project late in December and assisted with preparation of the final draft of the report on all activities of Task Group 7. The final report will be published next quarter.

The Ministry of Agriculture has been contacted to determine its interest in following up on findings and recommendations of this task group regarding the creation of a national soil testing service.

Personnel Assigned to this Task Group:

Mohammed Zenati, Richard Tinsley, Ahmed Taher.

TASK GROUP 8 - SOIL CHARACTERIZATION

Objectives:

1. To determine what soil management techniques are needed for best use of soil and improving water management.
2. To develop water management parameters based on soil characteristics.

Tasks Completed during Past Quarter:

1. Plans were proposed to collect data concerning the task group activities (soil moisture, infiltration rate, salinity, ...).
2. A paper on "Problems of Irrigating Vertisols in Egypt" was drafted and presented in the ASA meeting 1981.

Work in Progress:

1. Collecting the data specified in the work plans in the different areas.
2. Reviewing and discussing the data collected from the different areas.

Plans for Next Quarter:

The Agronomy discipline has some new staff and this needs some time for a new organization.

Personnel Assigned to this Task Group:

Ahmed Taher, Richard Tinsley, Abdel Hamid Fahim, Mohamed Zenati, Mohamed Helal, Ahmed Bayoumi.

TASK GROUP 9 - PEST AND DISEASE CONTROL

I. Progress of Work for Past Quarter:

- A.* Studies on the effect of irrigation on pest management of the most important pests infesting major crops of the three sites:
1. Effect of soil moisture content on pupal duration and moth longevity of the Black Cutworm; Agrotis ipsilon (Hufn.) infesting major crops of the three sites.
 2. Continue to work on the effect of soil moisture contents on pupal duration and moth longevity of the Cotton Leafworm; Spodoptera littoralis (Boisd.); the most serious pest infesting all crops in the three sites.
- B. Chemical control of pests surveyed in previous studies.
- C. Determination of the economic threshold of the most important pests infesting crops of the three sites.
- D. Revision of recommendations given to the farmers in Staff Paper #3 (Corn Insects), #4 (Rice Insects), #5 (Major Field Crop Insects and Their Control), #22 (Survey of Pests Infesting Mansouria Vegetables and Crops; Beni Magdoul and El Hammami Areas and Their Control), and #35 (Agricultural Pests and Their Control: General Aspects).
- E. Preparing a Technical Project Paper which incorporates all of the pest control work which has been done for the project.

Work Not Completed:

School for pest control.

This has been started by showing slides of pests and symptoms of infestation to Mansouria staff. The second step is to gather the farmers and arrange meetings with them. Extension staff will help in this activity.

II. Plans for Next Quarter:

- A. Starting extensive studies on Cotton Bollworms infestation in relation to irrigation intervals. The main Bollworms are the Pink Bollworm and the Spiny Bollworm.

*This work will be of vital value to the work of Task Group 1, "On-Farm Irrigation" and Task Group 2, "Water Distribution System."

- B. Delivering the draft of the Technical Project Paper of the pest control work.
- C. Beginning the meetings with farmers and extension staff for the pest control school.

III. Names of Personnel Presently Assigned to the Task Group:

Elwy Atala, Richard Tinsley, Jim Layton, Gamal Ayad, Anwar Keleg.

TASK GROUP 10 - CONJUNCTIVE USE OF WATER

Objectives as Modified by Action Memorandum No. 91 are to:

1. Review and evaluate existing water quality data which has been assembled by Task Group 10.
2. Determine what additional data will be required to classify drainage and well water for the suitability for conjunctive use.
3. Prepare a plan by which additional needed information may be obtained.
4. Collect all project data and combine with secondary data to prepare a report which meets the stated objectives of the task group.

Activities:

Major work during this quarter pertains to Dr. Verne Scott's TDY activities from October 19 to November 20. He worked with the staff in the three team areas and other project personnel concerning plans, frequency of sampling, methodology, results, and analysis of water quality in observation and deep wells and soil salinity.

Recommendations and procedures have been provided by him for systematic sampling and accumulation of water quality data for future analysis and evaluation.

With the limited data obtained during the past two years and during the Problem Identification Phase, he views the quality of water and soil to be in the range of "increasing" to "severe" problems.

The project has not had the question of conjunctive water use as a high priority objective. It is appropriate and timely to direct attention to these problems.

Plans for Next Quarter:

With the prospect of adding several new professionals to EWUP it is planned to reevaluate the objectives and work plan for Task Group 10. It may be feasible to collect and analyze additional water quality data which will enhance the project's output related to the objectives of this task group.

A "state of the arts" report will be forthcoming next quarter as a result of Dr. Scott's TDY visit in November.

Personnel Presently Assigned to the Task Group:

Maher, Hanson and Taha.

TASK GROUP 11 - IRRIGATION ADVISORY SERVICE

The Irrigation Advisory Service (IAS), Task Group 11, has focused on two major areas of analysis in order to examine the existing situation in terms of establishing such a service. First, there is the need to document how EWUP presents its different pilot programs to the farmers with the purpose of describing how a possible prototype to an IAS may actually perform. Next, an examination of the organizational environment into which the IAS must implement its objectives needs to be delineated. From these two areas of analysis, the objectives of the task group have been created and the work activities have been designed.

Objectives:

1. Make explicit provisions for providing the technical advice and assistance to farmers and farm organizations served by the pilot studies which will at least:
 - a. Provide technical advice and assistance to the individual farmer on irrigation practices and systems by cooperating with the existing extension service, village cooperative, and farmer organization.
 - b. Provide technical advice and assistance to the farmer organizations, which will be needed if the farmer organizations are to be successful, on expected water requirement, irrigation scheduling, maintenance of meskas and drains, etc.
 - c. Establish the responsibility for specifying the nature of and the person responsible for providing the technical assistance for each study.
2. Develop criteria and procedures for establishing a country wide IAS.
 - a. To define what should be the purpose and parameters of an IAS.
 - b. To delineate how an IAS is to be organized in terms of its personnel, administrative structure, procedures and programs.
 - c. To examine how the IAS is to be integrated into the existing institutional structure; i.e., what role will this service play in terms of other organizations.

- d. To examine the preparatory and training aspects of the staff members for this advisory service.

Tasks Completed:

For this past quarter the work on the Irrigation Advisory Service has focused on developing the conceptual underpinnings for analyzing such a service, and developing working procedures to demonstrate how such a service may operate. The activities performed this last quarter are:

1. Evaluation of the various types of on-farm activities performed by EWUP in terms of adoption in innovations (Kafr El Sheikh and Minya).
2. Delineation of criteria to be used in examining how innovations are diffused to a specific type of receiver group.
3. Initiation of specific work plans pertaining to the development of extension meetings for the farmers of the Kafr El Sheikh site.
4. Delineation of criteria to be used in examining the organizational parameters influencing the operation of the Irrigation Advisory Service.

Tasks Being Worked on Now and Future Plans:

The tasks being worked on now and for the next quarter will be an extension of last quarter's work. Documentation of how EWUP implements its pilot projects will continue with the emphasis on interaction with the farmers. Extension meetings will be initiated next quarter in Kafr El Sheikh. The conceptual delineation of criteria for both the innovation - diffusion procedures and the organizational parameters of the IAS will be developed in more detail. The work on the organizational aspect of the IAS will serve as a foundation for Dr. Ed Knop's TDY this summer.

Administration:

The names of the personnel presently assigned to this task group are:

Mohamed Sallam - Coordinator, Jim Layton, Abdel Hamid Fahim, Moheb Semaika, Ahmed Taher, Gamal Ayad.

No TDY support was present this last quarter and the next TDY scheduled is by Dr. Ed Knop for the summer, 1982.

MAIN OFFICE

The technical work of the main office is done through eleven task groups. The work is performed by 27 professional staff members with TDY assistance as indicated in the "Backstopping" portion of this report which follows. The main office and TDY staff works with field team personnel at each of the three project sites to conduct demonstrations and field tests, collect data, and carry out plans for all farms of interaction with farmers and local government officials.

In October Engineer Ahmed Maher joined the main office staff as senior engineer. He was assigned to Task Groups 1 and 10. In addition he was assigned to supervise construction of the Hammami Pipeline and to serve as the project's chief liaison with the contracting construction company.

The following is a complete list of personnel assigned to the main office as of December 31, 1981.

Hassan Wahby	Project Director
Gene Quenemoen	Technical Project Director
Farouk Abdel Al	Economics Discipline Leader
Dave Martella	Senior Economist
Gamal Ayad	Senior Economist
Mohamed Zanati (33% time)	Agronomy Discipline Leader
Richard Tinsley	Agronomy Discipline Counterpart
Anwar Keleg (33% time)	Senior Agronomist
Mohamed Salah (33% time)	Senior Agronomist
Moheb Samaika (66% time)	Senior Agronomist
Abdel Hamid Fahim	Engineering Discipline Leader
Eldon Hanson	Engineering Discipline Counterpart
Ahmed Maher	Senior Engineer
Mohamed Sallam	Sociology Discipline Leader
James Layton	Sociology Discipline Counterpart
Mohamed Helal	Computer Engineer
Azza Nasr ^{1/}	Computer Engineer
Tim Gates	Water Budget Engineer

^{1/} In training at CSU for 9 months.

Ahmed Bayoumi	Farm Mechanization Engineer
Bishara Ishac	Senior Engineer - Motor Pool
Nadia Wahby	Senior Engineer - Water Requirements
Abdel Atti Allam	Engineer - Water Requirements
Wadie Ragy	Engineer - Water Requirements
Mohamed Nabil Naguib	Engineer - Water Requirements
Farida Abdel Meguid	Engineer - Water Requirements
Ahmed Taher	Senior Agronomist
Elwy Attalla	Senior Agronomist
Mohamed Ahmed Salem	Senior Administrative - Personnel
Mohamed Said El Shater	Senior Administrative - Expeditor
Salah El Din Salem	Junior Administrative - Secretary
Sayed Sakr	Junior Administrative - Storekeeper
Zeinab Abdel Ghany	Junior Administrative - Inventory
Ekhlas Abdel Ghaffar	Junior Administrative - Secretary
Magda Yassin Mahmoud	Junior Administrative - Telephone
Ashgan Abdel Zaher	Junior Administrative - Photo Copier
Magda Mohamed Mosselhi	Junior Administrative - Secretary
Bamba Shaarawi Aly	Junior Administrative - Photo Copier
Maher Attalah	Junior Technician - Mechanical Work
Abdel Naby Youssef	Technician - Mechanical, Motor Pool
Ahmed Soliman Abdallah	Technician - Mechanical, Motor Pool
Ahmed Ibrahim	Junior Administrative - Motor Pool
Said El Said Elwi	Junior Administrative - Motor Pool
El Araby Mansour Shaine	Junior Technician - Electrician
Imam Sayed Wahba	Technician
Osman Shaker	Junior Administrative
Chaaban Mohamed Abdou	Telephone Operator
Boushra Beniamin	Senior Administrative - Accountant
Ahlam Abdel Rahman	Junior Administrative - Accountant
Taha Moustafa	Engineer - Water Laboratory
Ikram Mohamed	Engineer - Water Laboratory
Ahmed Ghanem	Technician - Water Laboratory
Susan Abou Shady	Junior Administrative - Library
Abdalla Gad	Technician - Motor Pool

Ahmed	Guard - Motor Pool
Saad Mansour	Management Assistant - Main Office
Hamdi Ahmed Hamdi	Translator - Main Office
Safinaz Sadek Taher	Secretary - Main Office
Jihan Sadek Abdel Nour	Secretary - Main Office
Mona Farouk Morsi	Secretary - Main Office
Nagwa Mohamed Ali Mazen	Public Relations and Administrative
Nawal Abdallah Ahmed	Accountant - Main Office
Moustafa Ibrahim Mahran	Electrician - Motor Pool

TRAINING

At the present time there are six project professionals in training abroad. They are:

Azza Nasr, Engineer, Colorado State University
 Elia Sorial, Economist, Colorado State University
 Esmat Wafik, Engineer, Colorado State University
 Ahmed Ismail, Agronomist, Colorado State University
 Amany El Kayal, Engineer, Utah State University, (Peace Fellowship)
 Mohamed Ragy Darwish, Bari Instititue, Italy, (Italian Government Fellowship)

Planning is now underway for the next on-farm water management training session to be held at the EWUP training center at Kafr El Sheikh. The dates will be July 31 through September 16, 1982.

Twenty-two project professionals are studying for and will be taking the TOEFL examination in March 1982.

Recommendations for training were prepared for discussion and approval by the Joint Committe which will meet in January 1982.

PUBLICATIONS

The following papers were submitted to the directors during the past quarter. They are being reviewed for consideration as Draft Working Papers and/or Project Technical Papers.

<u>Title</u>	<u>Author(s)</u>
Cotton Field Trials at Kafr El Sheikh, Summer, 1980	Magdy Awad, Amany El Kayal Tom Ley
Final Report for 1980-81 Winter Wheat Trials, On-Farm Pilot Program at Kafr El Sheikh	Kafr El Sheikh Team (edited by Tom Ley)
Trapezoidal Flumes for the Egypt Water Use and Management Project	A. R. Robinson
Soil Fertility Survey in Kafr El Sheikh, El Mansouria and El Minya Pilot Projects	Zanati, Soltanpour, Taher, Keleg
Data Base Book for Abyuha Canal and Meska 26	Rex Rehnberg
Root Penetration Index for Winter Crops, 1981	Tinsley, Bayoumi, Meleha, and Salah
Kafr El Sheikh: Farm Management Survey, Crop Enterprise Budgets and Profitability Analysis	Mohamed Haider and Farouk 'Abdul-Aal
Farm Record Survey and Analysis for Study Cases at Abyuha, Mansuriya and Abu Raya Sites	Farouk 'Abdul-Aal and Melvin Skold

The status of papers to be published as Project Technical Papers is summarized below:

<u>DWP No.</u>	<u>Title and Author</u>	<u>Proposed PTR No.</u>
70/26	Farm Record Summary Analysis... 'Aal/Skold	8
63	Rice Related Studies... Tinsley	9
77	Soil Fertility Survey... Zanati/Soltanpour	10* (with Soltanpour 1/82)

78	Kafr El Sheikh Farm Management Survey... Haider/'Aal	11
64/51/71	Use of Feasibility Studies... McConnon (51 & 71 = Appendices)	12* (with Skold 1/82)
62	Role of Rural Sociologists... Sallam/Layton	13
56	Challenge of Implementing Irrigation Prog.... Mayfield	14*
53	Village Bank Loans...	15
46a&b	Irrigation System Improvement by Simulation Reddy/Clyma	16*
45	Optimal Des. Border Irrig. Systems Reddy/Clyma	17*
25	Pop. Growth & Devel.... Perspectives Knop/Sallam	18 (if no answer Knop by March 1, proceed with PTR)
26	Effective Extension... Knop/Sallam	19
18	Rotation System on Contin. Flow... Kady/Wolfe	20
68	Livestock Enterprize on Study Farms Walters	(first 4 reviewers)
44	Soil and Land Classification... Heil	(first 4 reviewers)
	El-Hammami Pipeline Design... Sherith...	21*
	<u>Mesqa</u> 10 Design Paper... Ree/Gates	22

II. BACKSTOPPING PLANNING AND COORDINATION

In its work the P & C Committee meets weekly to review together past, present and future activities of the Project. The Committee members are Dr. W. Schmehl, Agronomy; Dr. W. Clyma, Agricultural Engineering; Dr. M. Skold, Economics; Dr. D. Sunada, Irrigation Engineering; and E. V. Richardson Project Coordinator.

Each P & C member served as advisor for the students from the Project taking course work in the States.

Committee members reviewed project work plans and reports, selected TDYs and backstopped their field team discipline counterparts.

Dr. Richardson was in Egypt in November where he discussed, along with Dr. Hassan Wahby, their recommendations for irrigation system improvement with H.E. Samaha, Ministry of Irrigation and Senior Ministry Officials. These recommendations are given in the appendix. After the meeting the Minister appointed two committees to review and make recommendations on these recommendations. The decree for these two committees is in the appendix. The Minister asked for an action program to implement the recommendations, Dr. Richardson proposed a draft action program for discussion and revision by project personnel.

The calibration of the farm turnouts developed by Dr. Mona El Kady and A. R. Robinson for the submerged case was collected. Data for the nonsubmerged case was sent to Egypt when Drs. Mona and Robinson compared the results, favorably, with a field installation and calibration on Meska 10. It was determined on the field installation that a pipe outlet at an angle to the horizontal would provide more head. Therefore Mr. Rashwan will calibrate the pipe outlet at an angle. Mr. Rashwan will use the calibration for his M.S. Thesis.

The P & C Committee made the arrangements for His Excellency, M. A. Samaha, Dr. M. Abu Zeid, Chairman Water Research Center; Eng. Waghi Abbas, First under Secretary of State for irrigation; Abdel H. Rady, Director of Technical Affairs, MOI; Sarwat Fahmy, Undersecretary of State, MOI.

To visit,

1. World Bank
2. Bureau of Reclamation, Denver
3. Salt River Project, Phoenix, Arizona

4. Coastal Engineering Research Center, Virginia
5. Corps of Engineers, Los Angeles, California

The trip took place November 14 to 23. Minister Samaha and President Abel signed the Exchange Agreement while in Phoenix, Arizona. Under this agreement 16 Egyptian professionals will work on the Salt River Project and 8 SRP professionals will work for the Ministry of Irrigation in Egypt. This agreement is in the appendix. This trip was paid for by the World Bank.

The water management effectiveness in controlling salinity and water logging study is nearing completion. The computer program has been written and has been applied to data from the Beni Magdoul area. The study has resulted in the development of a program that not only can be used to evaluate water management as a tool for salinity and water logging control but will provide for an optimal design of a drainage system based on an increase in crop production. Ms. Deanna Durnford is writing her dissertation in this study.

Omnia El Hakim is making good progress on her dissertation topic on the design of border irrigation systems.

Roger Slack's thesis titled "The Volume Discharge and Mechanical Efficiency of the Field Sakia" was completed.

A paper based on the thesis is under preparation. Mohammed Haider is proceeding satisfactorily in his analysis of the farm records for Kafr El-Sheikh. A report is expected next quarter which not only analyses the farm records but provides a methodology for the collection and analysis of farm records. Farm records provide the basis to determine farmer incomes, suggest changes in on-farm water management and associated agronomic practices to increase his income and provide a measure of the effectiveness of the suggested changes.

Mr. Tom Ley decided not to stay at Kafr El-Sheikh for another two years. Therefore a search was made through the CID Universities for a replacement. Thirteen applications were received. Engineer Ken Litwiller was selected and his name submitted to AID and the MOI for approval. Mr. Litwiller has an M.S. degree from Colorado State University in Agricultural Engineering and three years of overseas experience as an Irrigation Advisor in Kenya.

TRAINING

1. On-farm water management short courses and field trip plans were made to present the course in Egypt next summer. The dates for the course are July 31 to September 16 with the field trip in September.
2. Participant Training. The four trainees satisfactorily completed their first semester of training at CSU. Their courses and grades are as follows:

<u>Names</u>	<u>Courses</u>	<u>Hours</u>	<u>Grades</u>
Ahmed Esmat	AE 505 Irrigation Scheduling	3.0	C
	AE 535 Surface Irrigation System	3.0	C
	CE 699IV Thesis--Groundwater (Sunada)	3.0	S
	AE 538 Groundwater Hydrology	4.0	B
	M340 Intro Ord Diff Eq (not registered unofficial Audit per Sunada)		
Elia Sorial	EA 405 Agric. Prod. Management	3.0	S
	EA 695 V Independent Study		I
	EA 305 Farm and Ranch Records and Analysis	3.0	B
Ahmed Ismail	AE 505 Irrigation Scheduling	3.0	C
	AE 535 Surface Irrigation System	3.0	D
	AE 538 Groundwater Hydrology	4.0	B
	AG 795 V Independent Study (Franklin-Schmehl)	2.0	I
	AG 699 V Thesis	3.0	S
Azza Nasr	CE 563 Computational Methods	3.0	B
	CS 420 Applications-Formal Methods	4.0	B
	EG 510 Linear Program & Network Flows	3.0	A

3. Salt River Project Exchanges

Ed Kirdar and Al Risinger were in Egypt October 18 to November 1, 1981 to finalize the exchange program.

At a meeting in Phoenix, Arizona, His Excellency, M. A. Samaha, MOI, President Karl Abel, and Director John Fischer, CID signed the Exchange Agreement. Expectations are to implement the exchange next quarter after the extension to the project has been signed.

4. Special Training

The P & C Committee and Project Staff planned and arranged for various special training programs for project and MOI personnel. These were:

Engineer Ms. Amal Sabri, November 9 - December 11, Environmental and Health Aspects of Water Use. Dr. Dave Hendricks provided the training. The World Bank paid all costs.

Engineer Abdel Fattah Metawie continued his groundwater hydrology course via video tape.

Ahmed Fakhry, Mohamed El Shakib Aboul Azim, Yousuf Kamal, Abdul Ek Feki, Mahmoud Seif Isa, October 24 - November 8, study tour in Water Resources Planning and Management. Sponsored by World Bank, visited USGS, USBR, CSU, and Salinity Lab.

Plans were made for Abdel H. Fahim to participate in the on-farm water management training course that AID is presenting in India. Drs. Wayne Clyma and Max Lowdermilk are presenting the course.

TDYs

The following people went TDY to Egypt this quarter:

Dr. Bill Schmehl, Agronomist (December 29, 1981 - January 22, 1982) to visit each of the field sites, review the agronomic work at each location, and make recommendations to the Discipline Leader and the Project Directors regarding organization of the work during the remainder of the Project Life.

Dr. Parviz Soltanpour, Agronomist (December 28, 1981 - January 24, 1982) to work with Task Group 7 soil fertility, review soils laboratory work and work with Task Group 7 on-farm irrigation.

Dr. Dan Sunada, Engineer (December 28, 1981 - January 22, 1982) to assist with the planning and implementation of the groundwater studies.

Dr. Mel Skold, Economist (December 28, 1981 - January 22, 1982) to work on economic evaluation and follow up on 79-80 farm records analysis and other publications.

Mr. A. R. Robinson, Engineer (October 17, 1981 - December 4, 1981) to continue work on the design of turnouts with emphasis on the calibration of turnouts in the field.

Mr. Bill Ree, Engineer (September 1, 1981 - December 3, 1981) to work with Task Group No. 5 on the water budget.

Ms. Elizabeth Sherman, Editor (October 14, 1981 to April 14, 1982) to serve as project editor and help prepare project papers from more than 70 staff papers now available.

Dr. E. V. Richardson, Project Coordinator (October 16, 1981 - November 21, 1981) to make arrangements for continued staffing and to visit project sites to coordinate TDY needs and other backstopping services provided from the Fort Collins office.

Dr. Verne Scott, Engineer (October 19, 1981 - November 25, 1981) to help Task Group No. 10 to assemble water quality data on canal water, drainage water, and irrigation well water for each field site and to classify the drainage and well water for their suitability for conjunctive use.

Dr. Richard McConnen, Economist (October 2, 1981 - December 4, 1981) to work on developing baseline reports for the pilot programs, develop a paper, work on enterprise cost studies for main crops and review objectives and purposes of Task Group No. 4.

Dr. Rex Rehnberg, Economist (June 18, 1981 - December 27, 1981) to work with Dr. Quenemoen and the economics staff in the analysis of economic data.

Mr. Ed Kirdar, Engineer (October 18, 1981 - October 30, 1981) to complete the arrangements for the Salt River/Ministry of Irrigation Exchange.

Mr. Winfred Risinger, Operations Coordinator (October 18, 1981 - November 1, 1981) to complete the arrangements for the Salt River/Ministry of Irrigation Exchange.

Dr. Jim Meiman, Assistant Vice President for Research (November 27, 1981 - December 4, 1981) to visit the project to review progress being made.

EQUIPMENT

Purchase and shipment of equipment for the El Hammami pipeline proceeded as planned. Pumps were shipped and reviewed in Egypt. Assembly and testing of the controllers by the ERC shop proceeded on schedule. The flow measuring devices were calibrated. Miscellaneous equipment and replacement parts were purchased as requested by the field.

WORK PLANS

Major emphasis will be placed on backstopping Cairo on the pilot projects, task group studies and review of staff papers. Calibration of the new turnouts will be done in the hydraulics laboratory. Research will continue of basin irrigation, evaluation of drainage systems, water management alternatives, and conjunctive use of ground and surface water.

A joint P & C and Advisory Committee meeting in Cairo will be held January 16 to 22, 1982 to review project activities and EWUP recommendations for irrigation system improvement.

The SRP exchange will be implemented with two Egyptian engineers arriving in Phoenix the first part of March and two SRP engineers arriving in Egypt the first part of April.

Special studies and projects will be conducted for the four Egyptian project persons taking courses at CSU.

Equipment for El Hammami, Meska 10, and Abueha Canal will be procured as requested as will other equipment and parts.

The four Egyptian trainees at CSU will engage in special activities between semesters. Three will take part in a field trip to California where they will observe irrigation and management practices. One trainee will take a special interim course in Economics.

III. PERSONNEL

FIELD STAFF

No changes in field staff this quarter.

Mr. Tom Ley notified the project that he will not spend another tour in Egypt. Mr. Ken Litwiller was selected to replace him.

Drs. Tinsley and Layton and agronomist Braunworth have stated their willingness to renew their contracts. Drs. Tinsley and Layton for two more years and agronomist Braunworth for one more year. AID and the GOE has agreed to their extensions.

CAMPUS

The following people will travel TDY next quarter:

- M. D. Skold
- P. Soltanpour
- J. Wolfe
- W. Schmehl
- D. Sunada
- E. V. Richardson
- R. Brooks
- W. Ree

APPENDIX A
A COPY OF CHARTS PREPARED BY THE KAFR EL SHEIKH TEAM
FOR PRESENTING HISTORY AND IMPORTANT RESULTS OF THE WORK

EGYPT WATER USE AND MANAGEMENT PROJECT

(EWUP)

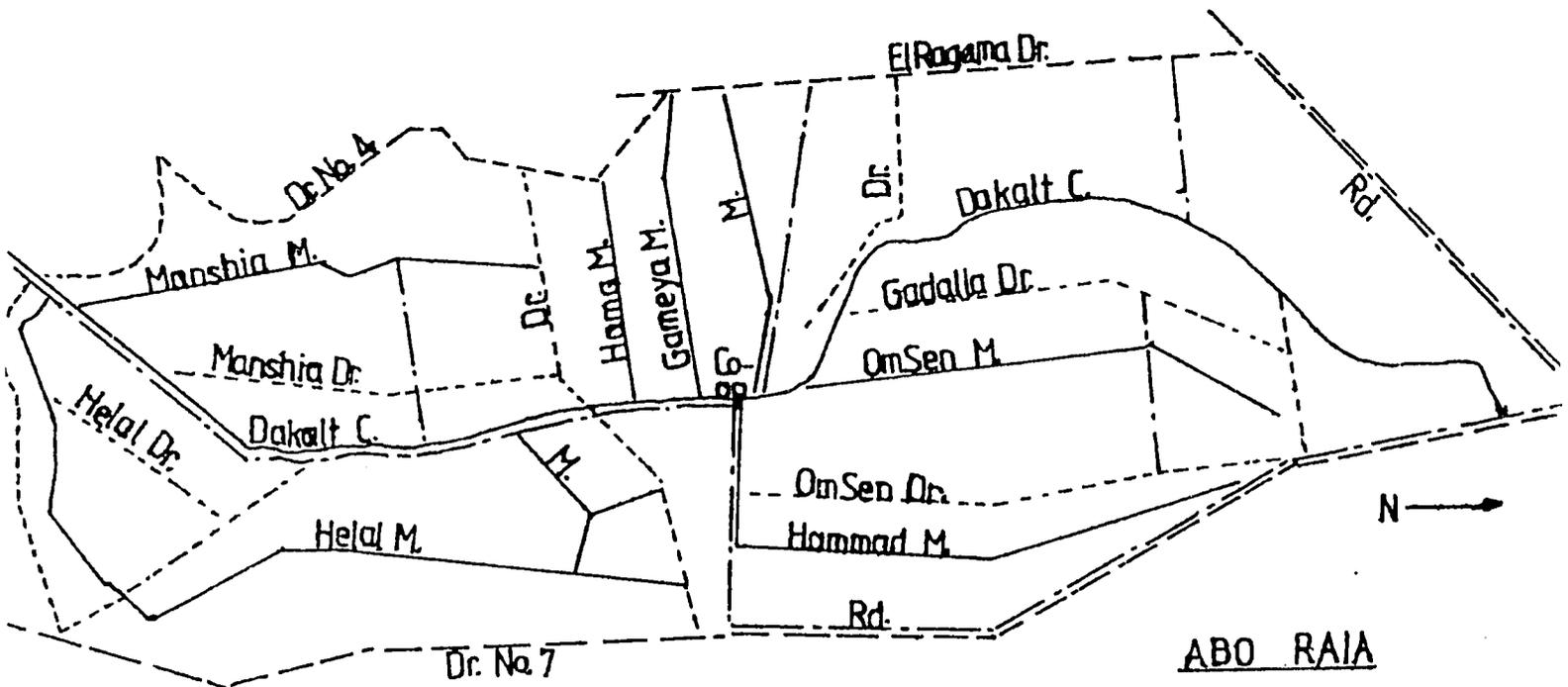
Goals:

1. Increase the socio-economic well-being of the small Egyptian farmer through.
2. Evaluation and improvement of on-farm water management.

Accomplished by: Interdisciplinary Group of Engineers, agronomists, sociologists, and economists who conduct a phased research program of:

1. Problem identification studies.
2. Search for solutions.
3. Evaluation of feasible solutions.
4. Implement solutions through pilot programs.

HISTORY OF WORK AT KAFR EL SHEIKH AREA



1. Problem Identification Studies: 1978-1979
2. Search for Solutions:
 - a. Field trials: Wheat crop, 1979-1980 (winter season).
 - b. Field trials:
 - i. Cotton crop, 1980 (summer season)
 - ii. Rice Crop, 1980
 - iii. Cor crop, 1980
3. Project Review, Evaluation and Planning for Pilot Programs:
Summer/Fall 1980
4. Pilot Program Implementation:
 - a. 1980-1981 Winter season
 - b. 1981 Summer season

Summary of Problem Identification Studies:

(see EWUP Technical Report No. 6 and EWUP Mid-Project Report, Vol. 1).

Irrigation and Drainage:

1. Unequal poor distribution in branch canal.
2. Poor maintenance of meskas.
3. Over-irrigation of crops.
4. Poor condition of on-farm conveyance channels.
5. Poor distribution of applied irrigation water.
6. Poor layout and design of irrigation basins.
7. High, Fluctuating water table.
8. Nonfunctional field drains.
9. Poor maintenance of collector and secondary drains.

Agronomic:

1. Poor varieties.
2. Soil Salinity is high.
3. Zinc deficiency.
4. Poor infrastructure support for providing fertilizers, chemicals, seeds, and equipment.

Socio-economic:

1. Increasing cost of labor and machinery.
2. Poor infrastructure support and deficient extension service.

SEARCH FOR SOLUTIONS

1979-1980 WINTER SEASON FIELD TRIALS ON WHEAT CROP, K.E.S.

Test of (a) Management (EWUP Recommended Practices) vs.
(b) Management (the Farmer's Traditional Practices)

EWUP Recommended Practices:

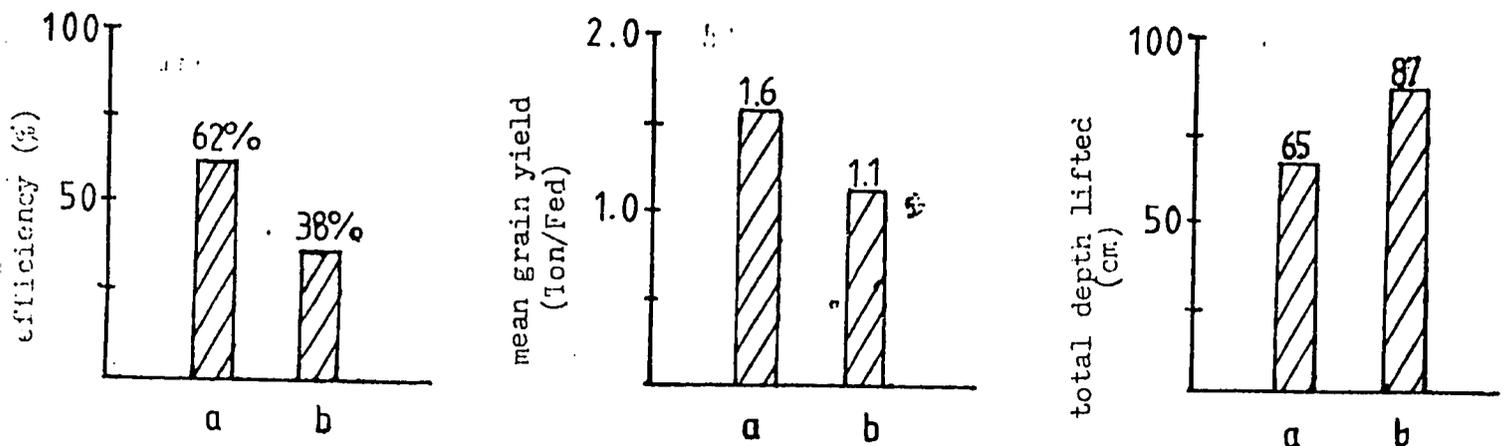
Land leveling to dead level, dead level border irrigation, field drain elimination, irrigation scheduling, use of correct fertilizers (timing and amount), new variety, apply zinc sulphate. (Tested on 7 farms).

Results (see EWUP Staff Paper No. 57):

60% increase in
irrigation effic.

42% increase in
yield

34% water savings



Other:

1. Time required to irrigate one feddan reduced by 33 percent.
2. Measured consumptive use for wheat = 45.3 cm.
(1900 m³/feddan).
3. Partial budget analysis estimated average increase in net income of LE.9.730 per feddan.
4. Land leveling costs estimated to be LE. 35 per feddan (this is very high; but it was first experience).
5. Improvements also yield significant labor savings.

SEARCH FOR SOLUTIONS

1980 SUMMER SEASON FIELD TRIALS ON COTTON CROP, K.E.S.

Four Treatments Tested on Four Strips on 6 Farms:

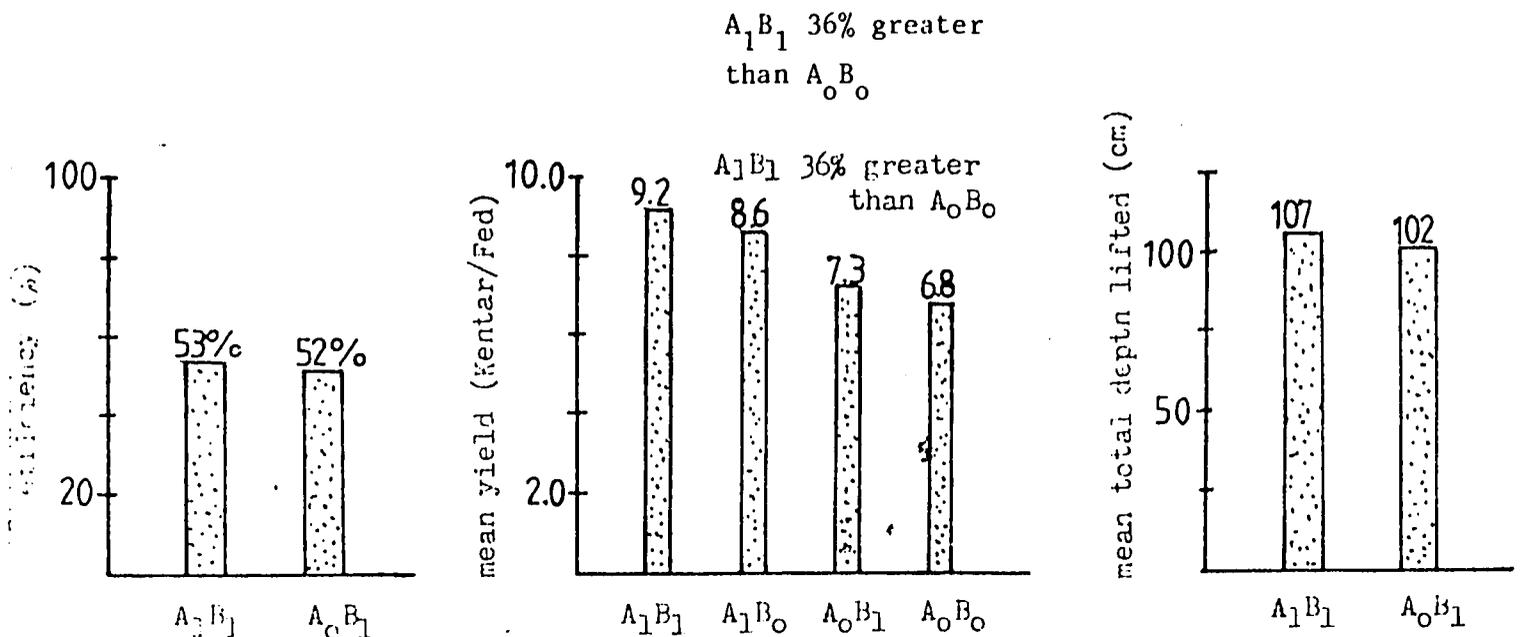
A_0B_0 : The farmer's traditional methods for cotton.

A_0B_1 : The farmer's traditional methods for irrigation with EWUP recommendation on fertilizers and chemicals (Zinc sulphate herbicides, soil fungicides, etc.).

A_1B_0 : EWUP's recommended irrigation practices (land leveling, dead level long furrow irrigation, irrigation scheduling) with farmer agronomic practices.

A_1B_1 : Combined EWUP recommendation concerning irrigation and agronomic practices.

Results:



Irrigation results are generally the same: yields were greater for A_1B_1 and A_1B_0 due to the better plant population for these strips. Land preparation (land leveling and making furrows) was a major factor in these increases.

Other:

1. For the A_1 package irrigation time was 7.5 percent less than for a package.
2. Measured consumptive use for cotton = 89 cm ($3740 \text{ m}^3/\text{feddan}$).

Irrigation water control (and thus irrigation efficiencies) was not improved in these field trials due to inability to construct the large well-defined furrows necessary for dead level furrow irrigation. Poor maintenance of the furrows through the season contributed to decreasing ability to control water.

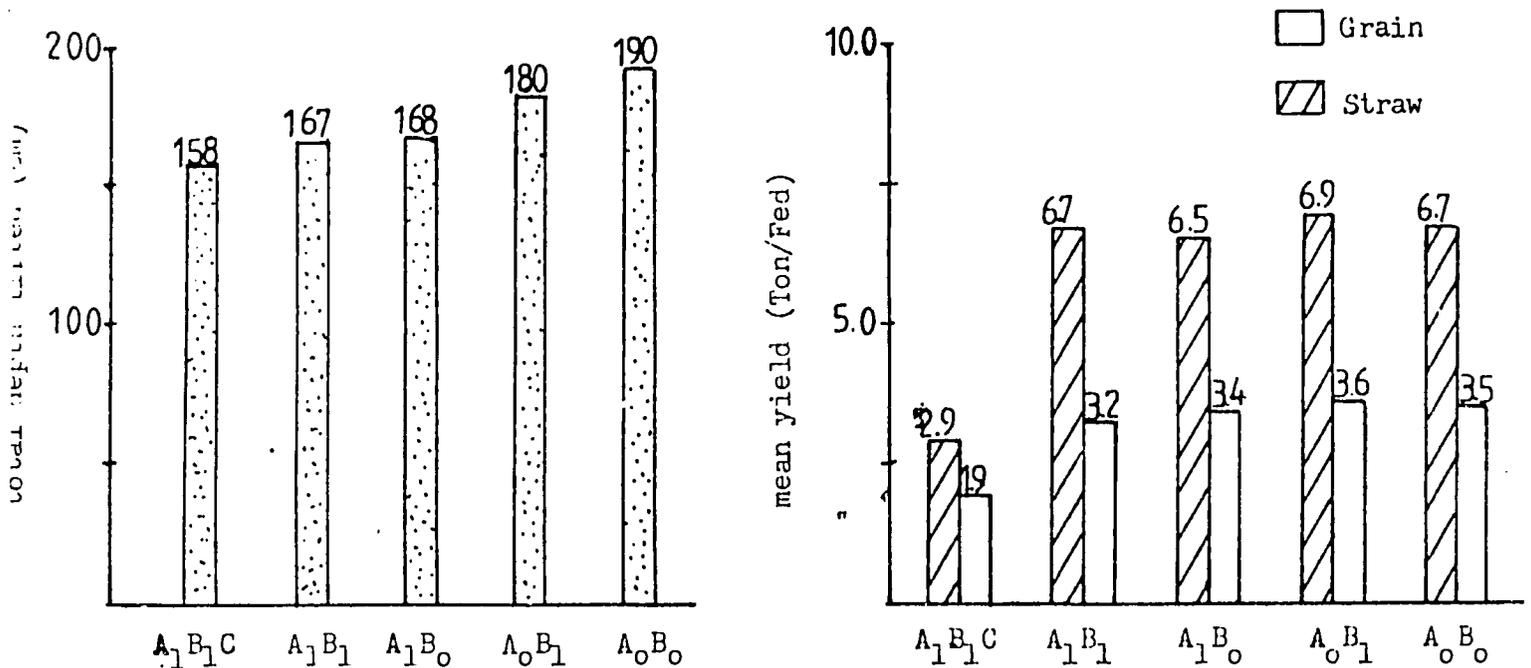
SEARCH FOR SOLUTIONS

1980 SUMMER SEASON FIELD TRIALS ON RICE CROPS, K.E.S.

Five Treatments on 5 Strips on 3 Farms:

- $A_0 B_0$: Traditional farmer practices.
- $A_0 B_1$: Traditional farmer irrigation practices with EWUP agronomic recommendations (fertilizers, zinc, etc.).
- $A_1 B_0$: EWUP irrigation practices (same as for wheat 1979-80 field trials) with farmer agronomy practices.
- $A_1 B_1$: Combined EWUP irrigation and agronomy practices.
- $A_1 B_1 C$: $A_1 B_1$ with mechanical transplanting.

Results:



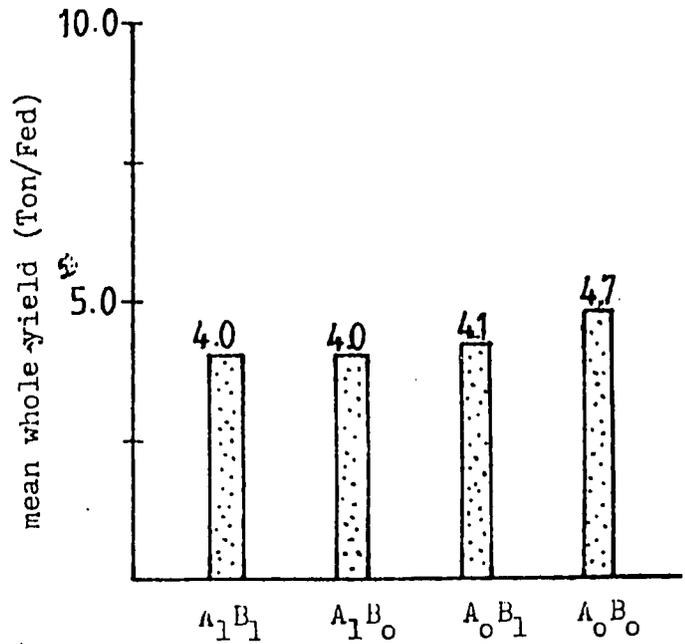
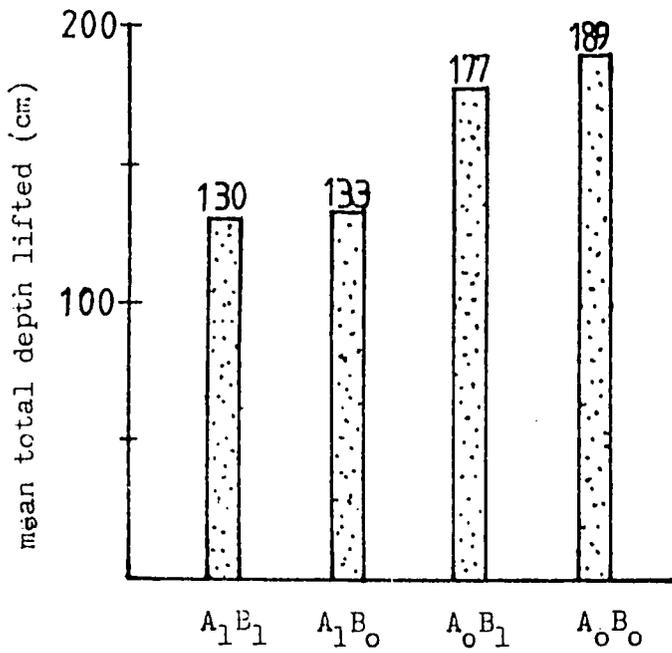
1. Mechanical transplanting was unsuccessful.
2. A_1 package resulted in average 14 percent water saved vs. A_0 package.
3. Yields were essentially equal for the first four treatments.

SEARCH FOR SOLUTIONS
1980 SUMMER SEASON FIELD TRIALS ON CORN CROP, K.E.S.

Four Treatments on Four Strips on 2 Farms:

- A_0B_0 : Traditional farmer practices.
- A_0B_1 : Traditional farmer irrigation practices with EWUP recommended agronomic practices (fertilizers, insect control, etc.).
- A_1B_0 : EWUP irrigation practices (same as for cotton) with farmer agronomy practices.
- A_1B_1 : Combined EWUP irrigation and agronomy practices.

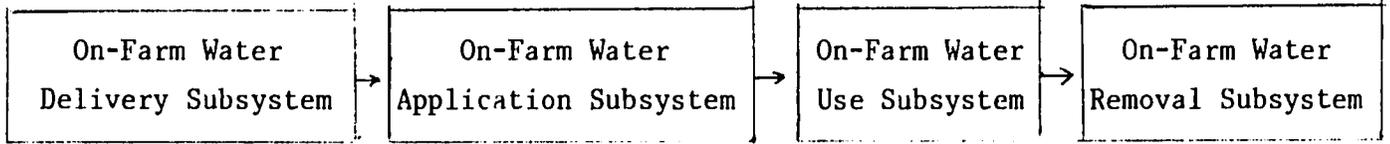
Results:



1. Insect control was not successful.
2. A_1 package resulted in average of 39 percent less water applied compared to A_0 package.

KAFR EL SHEIKH PILOT PROGRAM PLANS

1. On-farm water management and irrigation system improvement pilot program: implement on-farm units in each of the areas served by Hammad and Manshia meskas. The following package of practices:



<p>On-Farm Distribution System Redesign Marwa Improvement</p>	<p>1. Precision land leveling 2. Irrigation system design a. dead level border irrigation b. dead level long furrow irrigation 3. System layout design</p>	<p>1. Irrigation scheduling (when and how much) 2. Agronomic recommendations for crop production a. variety b. fertilizer use (timing-type-amount) c. pest control d. cultural practices (planting-harvesting-seed rates)</p>	<p>1. Field drains. Elimination of unnecessary drains. Improve remaining drains</p>
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2. Farmer organization (on meska level):
 - Develop with farmers programs for routine cleaning and maintenance of delivery canals (meskas serving their areas).
 - Develop among farmers an ability to schedule irrigations among themselves during critical water use periods.
3. Special Studies:
 - Continue water budget study at Om Sen meska.
 - Study Aboraia area water delivery and distribution.

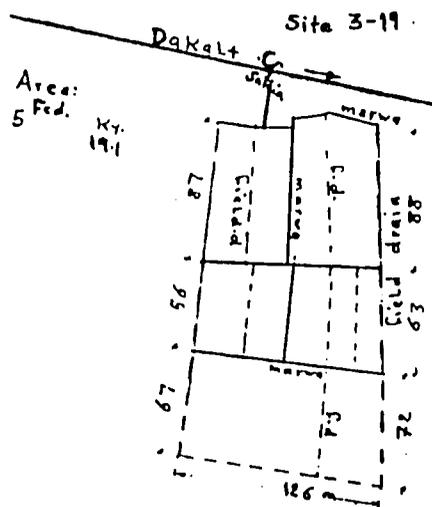
PILOT PROGRAMS

I. K.E.S. 1980-81 Winter Season On-Farm Pilot Program:

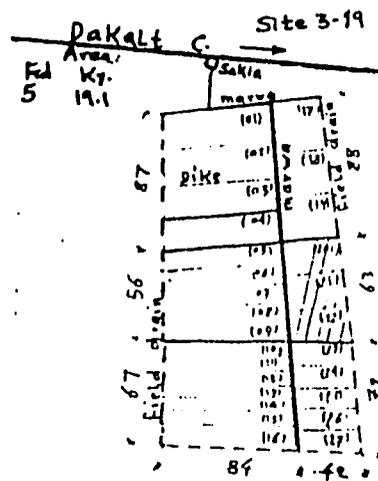
Package of practices implemented on 5 farms:

- 2 in Hammad pilot area.
- 3 in Manshia pilot area.

Example:



Before



After

System Design

- a. Land leveling to dead level on 4.8 feddans
- b. Elimination of 3 field drains and marwas
- c. Construction of new marwa which is less than half the length of the old one
- d. Construction of level border strips (30-85 m length, 11-30 width)

Land leveling costs estimated to be LE.22 per feddan (overall approximate mean cost for earthmoving = LE. 0.175/m). See EWUP Staff Paper No. 61 for details.

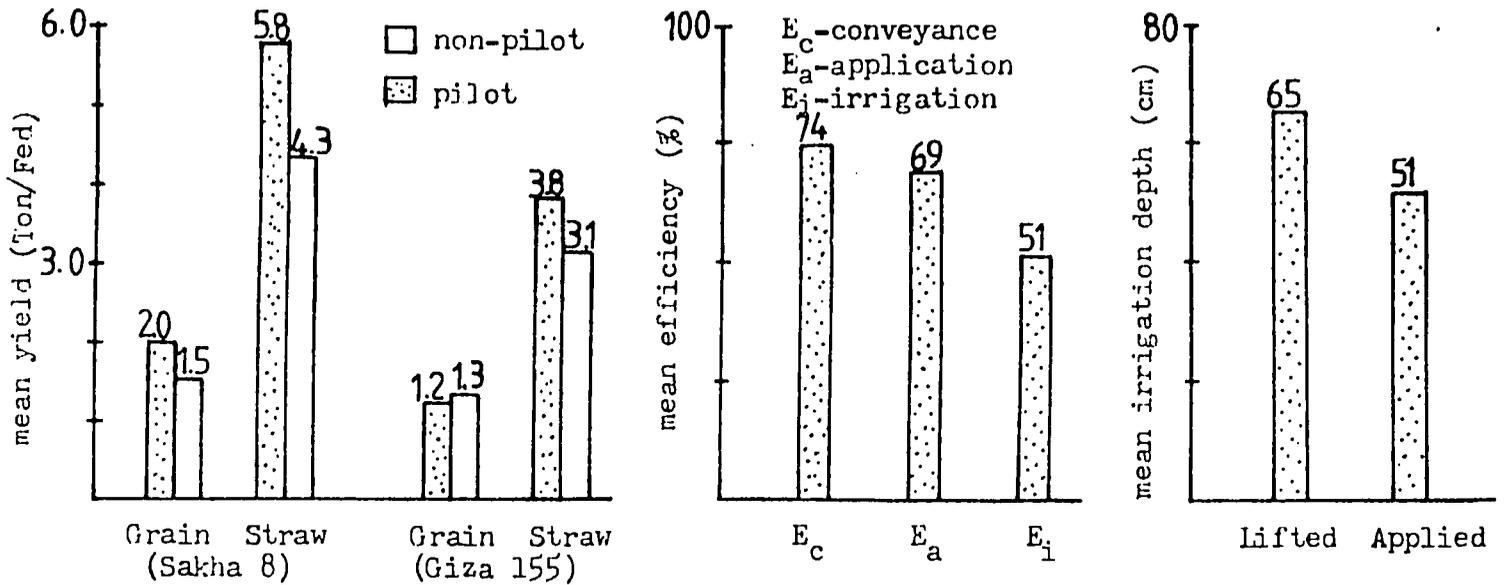
II. 1981 Winter Closure Meska Cleaning Program:

Farmers were organized on Hammad, El Manshia and Om Sen meskas to manually clean their meskas.

- 1. Sociologically, these organizational efforts were considered successful.
- 2. Technically, meska cross sections were not completely restored to the desired design sections.
 - a. Removal of weeds and other obstructions benefitted water flow in the meskas.

K.E.S. 1980-81 WINTER SEASON ON-FARM PILOT PROGRAM

Results (Mean of 5 Pilot Farms):



1. Mean yields for variety Sakha - 8 were 22 percent and 35 percent greater for grain and straw, respectively, on pilot farms than on nonpilot farms. Sakha - 8 is recommended variety.
2. On-farm conveyance losses were found to be excessive on some farms; measured loss rates: $0.08-0.8 \text{ m}^3/100 \text{ m/min}$ or from 10 percent to 70 percent of the water lifted during a single irrigation.
3. Measured wheat crop consumptive use = $187 \text{ m}^3/\text{feddan}$ (44.6 cm).
4. Economic analyses (partial budget) show increases in net farm income from LE. 20 to LE. 57 per feddan for Sakha - 8 growers on pilot farms.

Conclusion and Recommendations:

Essentially the same positive results were obtained this season as for 1979-1980 winter season: yield increase, increased efficiency, water saving, estimated increase in net farm income. This supports the validity of the pilot practices. Efforts should be aimed at continuing this successful program with focus on reducing marwa losses. Farm inputs need to be made available to farmers in proper type, amount and time.

K.E.S. 1981 SUMMER SEASON ON-FARM PILOT PROGRAM

1. Cotton Crop:

2 farms in Hammad pilot area, 3 farms in Manshia pilot area.
Land leveling, system layout and long furrow irrigation design
on about 24 feddans.

Some farmers in Abo Raia adopted long furrow irrigation for
cotton without direct EWUP intervention.

2. Rice Crop:

1 farm in Hammad area, 2 farms in Manshia area.

Land leveling, system layout and level border irrigation
design on about 7.9 feddans.

3. Corn Crop:

1 farm in each of Hammad and Manshia pilot areas.

Land leveling, system layout and long furrow irrigation design
on about 2.7 feddans.

Recommendations for agronomic and cultural practices to improve produc-
tion are made to each farmer and for each crop.

APPENDIX B
AGENDA OF JOINT MEETING OF
EWUP ADVISORY COMMITTEE AND
CAMPUS POLICY AND COORDINATING COMMITTEE

AGENDA
 JOINT MEETING
 OF
 EWUP ADVISORY COMMITTEE
 AND
 CAMPUS POLICY AND COORDINATING COMMITTEE
 January 16 to 20, 1982

Saturday	0830	Opening Remarks (Conference Room, EWUP Headquarters)	H.E. Samaha
	0845	Task Groups & Pilot Programs	Dr. H. Wahby
	0900	Review of Project Activities to date. This is a slide presentation showing the history of the Project, and "before and after photographs" of Project interventions.	Dr. M. Sallam
	1000 1030	Proposed publication procedures Refreshments	Dr. G. Quenemoen
	1045	AID's Program in Egypt*	Director Brown*
	1115	Training programs; non-degree, and On-Farm Water Management Short Course	Dr. Richardson and Dr. Sunada
	1145	Discussion	
	1215	Adjourn	
Sunday January 17	0800	Depart for Mansouria from EWUP Headquarters	
	0900	Orientation: Mansouria Field Office	
		a) Meska 10 Pilot Program (see page 4)	
		b) El-Hammami Pipeline Pilot Program (see page 4)	
		c) Other activities	Dr. Mona El Kady

*Subject to change to January 20 due to commitments pending in Director Brown's office.

Sunday January 17	1030	Visit El-Hammami		
	1200	Visit Meska 10		
	1300	Lunch - Location to be announced		
	1610	Depart for El-Minya by EWUP Vans. Evening meal and housing arrangements to be announced		
Monday January 18	0900	Orientation: Minya Field Office		
		a) Meska 26 Pilot Program (see page 5)		
		b) Abueha Canal Pilot Program (see page 6)		
		c) Other activities	Eng. Abdel Raouf	
	1030	Visit Meska 26 and Abueha Canal		
	1230	Discussion at the Field Office		
	1330	Lunch - Location to be announced		
	1400	Return to Cairo		
	Tuesday January 19	0800	Depart for Kafr El Sheikh from EWUP Headquarters	
		1000	Orientation Kafr El Sheikh Field Office	
		a) Manshia Pilot Program (see page 6)		
		b) Hammad Pilot Program (see page 6)		
		c) Other activities	Eng. Kamal Ez El Din	
1130		Visit Field Sites		
1330		Lunch - Location to be announced		
1430		Return to Cairo		

Wednesday January 20	1730	Opening Remarks (Conference Room, EWUP Headquarters)	H. E. Samaha
	1745	Summary of Committee findings and proposed programs	Dr. H. Wahby
	1830	AID's program in Egypt	Director Brown
	1900	Break	
	2000	Discussion of EWUP recommendations for further programs in OFWM research	
	2030	Discussion of EWUP recommendations for ministry action programs to implement OFWM into the irrigation operating sector	

RECOMMENDATIONS FOR IRRIGATION SYSTEMS IMPROVEMENT

By

Hassan Wahby and E.V. Richardson

I. Introduction

The Egypt Water Use and Management Project (EWUP) has worked on applied water management research since January 1978. The first phase of the project focused on identification of the problems constraining optimal crop production and the efficient use of water. The second phase research feasible solutions to the problems and the third phase is to develop implementation programs. The project was to be completed in June, 1982, but has been extended until June 1984 in order to complete the pilot implementation programs and finalize recommendations for Ministry of Irrigation (MOI) interventions. Nevertheless, at this time some recommendations for MOI interventions can be made for on-farm water management and delivery system improvement. They are based on project data, project reports, and the experience and knowledge of project personnel which have worked on the project for the last four years.

Project results are that improved on-farm water management will increase crop production, save water, energy and land and improve the social economic conditions of farmers and, thus, increase Egypt's gross national product. Improved on-farm water management requires full control and management of the water in the system. This requires improvement of the physical system (meska, branch and main canal), improved on-farm water management, linkage between the user (farmers) and the suppliers (MOI), continued monitoring of the operation and maintenance of the irrigation delivery system and on-farm water management and continued research with

linkage between research and operations. To accomplish full control and management for increased food production and saving of water, energy and land EWUP makes the following recommendations:

1. Delivery system improvement (canals and meskas).
2. Improved on-farm irrigation system and methods.
3. Where possible deliver water to farms with sufficient head to permit efficient application of water on fields by gravity.
4. Continuous flow in the branch canal with scheduling of water to the meska by fixed time or variable time rotation wherever main canal capacity makes the continuous flow feasible.
5. The establishment of an irrigation advisory service in the irrigation sector at the district level to provide a linkage between the farmer and MOI.
6. The establishment of farmer organization at the meska level to schedule water between farmer users, clean and maintain meska and drains and to serve as a linkage between farmers and the MOI.
7. The establishment of an irrigation monitoring service to monitor on-farm irrigation practices, measures the quantity and quality of water flowing in the system in their area, monitor the condition of the delivery system and drain and serve as link between research, operations and the farmers.
8. Establish pilot projects of a command area size where the above recommendations can be implemented, monitored and improved. The North Zifta project could be one pilot project and another pilot project should be started in another region. We further recommend the formation of a Command Area Redevelopment Authority (CARA) to design, supervise construction, and operate and maintain the improved system.

as at present and in new areas which may have different problems.

The research in the present three areas to be transformed into operating units, possible as monitoring service, to implement the present findings as soon as possible.

10. Continue training programs in on-farm water management.

The ten recommendations are expanded on in the following section.

II. Recommendations

1. Delivery system improvement

Water courses in Egypt were designed to accommodate flows needed to meet the crop water requirements of the various areas. As the Nile is the only source of water, a very large network of water courses are involved in the distribution system. As a consequence of this large system, a considerable amount of water seeps from the conveyance canals, particularly from canals that are composed of sand and silt. Also, considerable water flows out of the delivery system to the drains through poor management and the lack of night irrigation. Although, the water that seeps and runs from the canals is not lost to Egypt in the Nile Valley (Upper Egypt) and Upper Delta it causes discharge problems, waterlogs the land, and causes water shortages at the end of the canals and meskas. In the Lower Delta the seepage or surface water flowing from the tails of canals or meskas is lost from the system and into the sea. In order to insure efficient conveyance system and in order to conserve water and increase crop production many measures have to be taken into consideration. These are:

- a. Design cross section should be as small as possible based on the condition of flow (continuous or rotation) and sediment characteristics of the bed. Because of lack of maintenance these cross sections of branch canals and meskas are broad and shallow often choked with weeds and, thus, very inefficient resulting in over irrigation at the head of the ditches and under irrigation at the tail.

- b. The head loss in the distribution system should be minimum in order to maintain a potential head at water course intakes for efficient irrigation.
- c. Control structures, head gates, turnouts and measuring structures should be operated and maintained efficiently in order to regulate the waters so that it meets crop water needs.
- d. In order to save water in the conveyance system, three alternatives have to be considered.
 - i. Lining could be used in light soils where large amounts of seepage are experienced. It also should be considered in all soils to maintain stability of the canal cross section, control weeds and decrease cross sections.
 - ii. Conjunctive use of surface and ground water in medium and heavy soils where drainage problems occur, particularly where the ground and surface water are of good quality.
 - iii. Buried pipeline is an alternative to be considered as a distribution system on a demand basis especially in the sandy soils on the fringe area between the desert and the Nile Valley and Delta.
 - iv. Periodic maintenance to keep the water courses free of weeds and of good cross sections are necessary in order to insure efficient on-farm water irrigation. This maintenance program at the meska level can best be assured if accomplished by the farmer user.

We recommend that cross sections of the meskas, branch and main canal be reconstructed to a design cross section and slope to deliver the water requirements for the cropping system in the area. And that organizational methods be developed to maintain the meskas and branch canals. At this time our research indicates that well designed earth section is cost effective.

EWUP is investigating the cost effectiveness of buried pipeline and other lining procedures. The result of the research is not available at this time. However, recommendations following will provide some answer to the organizational and operational needed for the maintenance for meskas and branch canals.

2. On-farm irrigation

Farm irrigation is the backbone of the system. Considerable attention must be paid in order to maintain an efficient field application that matches the soil conditions, type of crop, weather pattern, quality of the irrigation water, and boundary conditions that describe the particular characteristics of the field. In addition, activities in different adjacent fields have to be considered. The yield response of the crop demands upon the timely input of many factors such as water, fertilizer, pesticides, etc. This requires the choice of correct seed varieties, type of fertilizers, insect and pest control, etc., that suit the soil conditions in an agricultural package by itself. However, surface irrigation under no control and management will stress the plant and decrease yield. In order to use surface irrigation efficiently many practices have to be considered such as land leveling with long furrows or land leveling with basin and short furrows. For good crop production a surface irrigation system must be selected that can maintain the soil moisture at field capacity and uniformly over the field with minimum loss of water and use of energy. Frequency of irrigation, as related to crop water requirements is related to the season of the year, has to be determined in order to maintain the moisture conditions needed by the plant. Often for many crops there is a critical period of time when a plant should not be subject to stress either of too much or not enough water. In addition, consumptive use, leaching requirements, pre-irrigation have to be well defined in order to allocate the proper amount of water needed.

On the bases of EWUP research we recommend long level furrow or level basin irrigation. Fields should be precision leveled for uniform irrigation. Efficient irrigation requires between one and two cfs discharge and adequate head to irrigate a field one feddan in size. The delivery system must be improved in order to deliver water to all areas in a canal command area in a timely manner to meet crop water requirements.

3. Gravity

It is recommended that the project continue to investigate the feasibility of delivering water to farms with sufficient head to permit efficient application of water on fields by gravity (without lifting by the farmers from meskas and canals). The water should reach the farm gate with adequate head and in sufficient quantity to make possible high field irrigation efficiency. Project findings show that gravity irrigation can achieve high field efficiency without burdening the farmer with the cost of lifting the water (LE 35.0 to LE 50.0 per year per feddan). Project findings also indicate that farmers can waste water even when they are required to lift it on their fields because they spend too much time lifting water and not enough time managing it. Poor gravity systems (small head and low flow) also waste water because fields are not covered quickly enough for high field efficiency.

Research must continue in order to determine how gravity flow systems can best be managed. Gravity flow systems offer an opportunity to reduce costs and increase farm income but it is imperative that such systems are well organized and managed.

4. Continuous flow in branch canals

We recommend that in any modifications to the existing system either on a branch canal or on a major canal (command area development) basis that where feasible, branch canals deliver water continuously and the flow into the meskas be scheduled on a systematic basis. The scheduling of the water to the meska can be either on a fixed rotation time or a

farmer schedule time basis. This type of continuous flow system will require headgates or closed vents on the meskas, farmer organization and trained branch canal operators. Continuous flow with control will decrease branch canal cross sections, meska cross section, save land and increase production. The Beni Magdoul Canal in Mansouria district is an example of the advantages of a continuous flow branch canal.

5. Irrigation Advisory Service

It is recommended that an Irrigation Advisory Service be established at the district level. This service to be established on a pilot basis in one or two districts. The Advisory Service to consist of a central interdisciplinary core group working out of the district office and generalist (ag. engineer) working with the farmers on one or two branch canals. The interdisciplinary core group to have an economist, agronomist, sociologist, agricultural and irrigation engineers. The Advisory Service is to advise and help farmers on improved irrigation practice, land leveling, meska improvement, keeping farm records, cleaning the meska and drains, introducing improved agronomic practices, water scheduling, etc. The Advisory Service is also to advise the district engineer and MOI officials on farm problems, water scheduling, canal maintenance, etc. The Advisory Service would not advise farmers on seeds, fertilizers, pest control, etc., unless asked by the farmers. The Advisory Service's primary responsibility would be improved irrigation practices and serve as a linkage between the Ministry of Irrigation and the farmers. This Advisory Service would enable the Ministry of Irrigation to fulfill its primary objective of serving the water needs of the farmer.

6. Farmer organization

Farmers on a meska should be encouraged to organize in order to optimize the operation and maintenance of the meska, increase crop production, assure every farmer of his proper share of water, produce more efficient on-farm irrigation and improve communication between Ministry of Irrigation and the farmer. The farmer advisory service would help in this

organization. Presently, in the three project areas that EWUP is working farmers have shown a wiliness to organize to solve their farm water management problems such as water scheduling and maintenance of the meska and drains. Project personnel has served as a catalyst for these farmer organizations. It is suggested that the farmer advisory service could provide this catalyst in other areas.

7. Monitoring service

A major consideration of EWUP is how to transform project findings into the irrigation sector. It is the age old problem of transfer of knowledge into practice. How to implement findings. It is recommended that an irrigation monitoring service in each government be formed to serve as this tranfer agent. The monitoring service to be in the irrigation sector and to continuously be evaluating on-farm water management and delivery system problems. When they find problems that needs research they would refer it to the water research center. When the water research center had recommendations it would be the duty of the monitoring service to implement the findings through the district engineer, the advisory service, the extension service of the Ministry of Agriculture and farmer organizations. The monitoring service to be responsible for monitoring the quality, quantity of the water in the canal and drains. This monitoring service to be the link between operations and research.

8. Pilot Project

It is recommended that project findings be incoperated into a major pilot project to test economic feasibility, to developed methodology for implementation of project finding on irrigation improvements into other areas and to determine farmer and government acceptability. To carry out this recommendation a single irrigation command area should be selected, such as the North Zefta Canal. A Command Area Redevelopment Authority should be created (CARA) headed by senior MOI staff member. CARA to have the authority to supervise the design and construction of an improved

irrigation system and to maintain and operate it after reconstruction. CARA staff would not necessarily design the improvements, this could be done by the new project planning unit in the Ministry of Irrigation, but CARA project staff would supervise and have final say in the design. It is further recommended that the CARA provide or control all technical and commodity inputs to the farmer. This would include seeds, farm loans, fertilizer in addition to water. CARA would have a farmer advisory committee in addition to a technical advisory committee. The farmer advisory committee to be formed of farmers in the area. The technical advisory committee could consist of members from the Ministry of Agriculture, Ministry of Land Reclamation and other Ministries in the cabinet. CARA would have a farmer advisory service to form and work with farmer organizations that are formed at the meska level.

9. Future research

EWUP has determined the major problems causing poor on-farm water management that decreases crop production and wastes water. It has recommended major ways to solve these problems, but there is still research that needs to be done. The project worked in three areas that are typical of much of Egypt. It has researched technical solutions to the problems, however, there are other areas of Egypt such as Garbeya, and Qenya government that needs study and there are other technical techniques that need further research. Some of the technical problems are economic methods of lining canals and meskas, conjunctive use of ground and surface water, improve surface irrigation methods, vertical drainage, consumptive use, management of high water table for good crop production, evaluation of pilot projects and to test the use of new irrigation systems such as bubble and drip in orange groves and other orchard crops.

10. Training

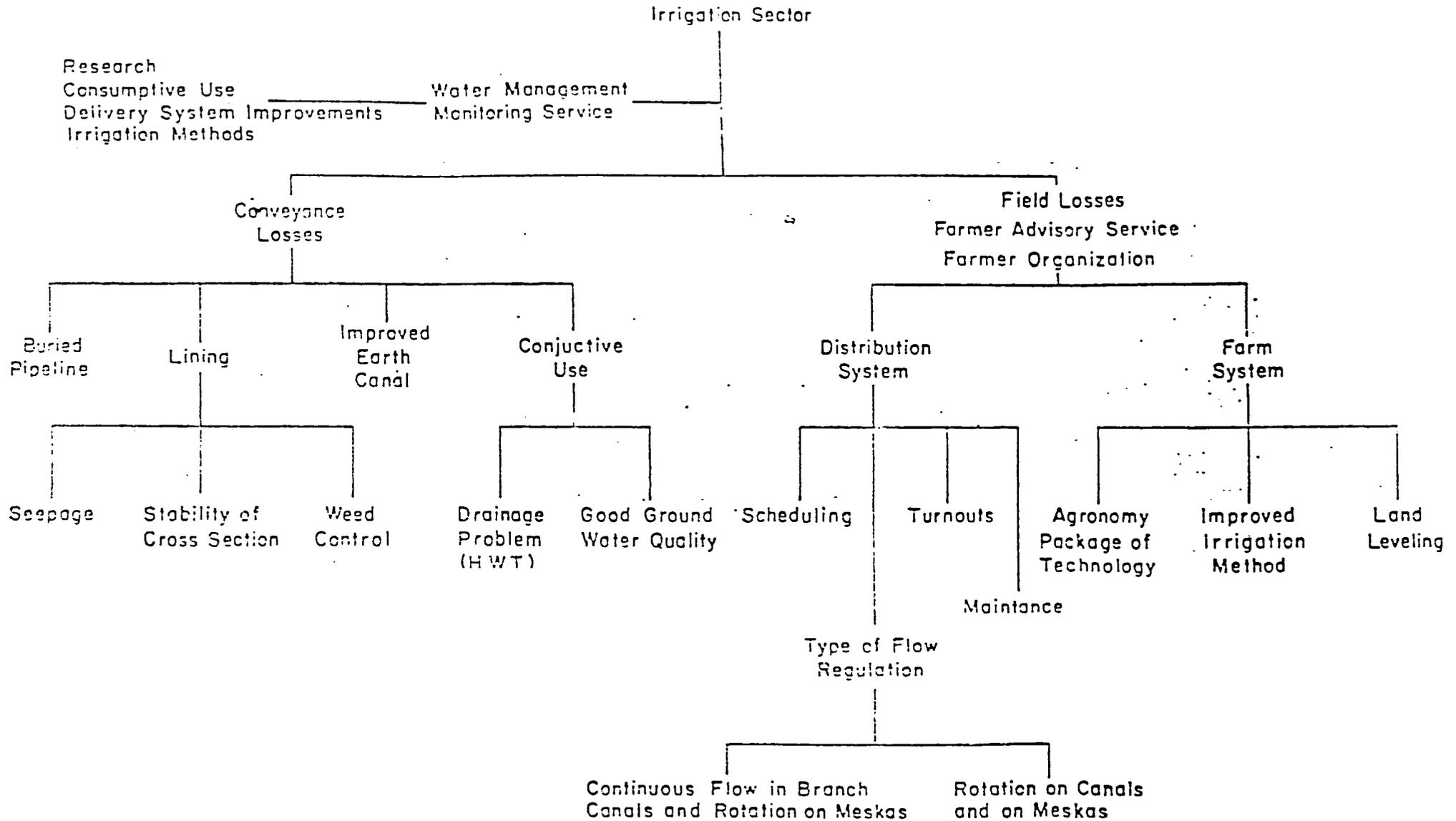
We recommend continued training of the professional staff in the Ministry of Irrigation in all aspects related to on-farm water management.

This training to be (1) a continuation and expansion of EWUP's on-farm water management short course, (2) send Ministry of Irrigation personnel to take two semesters of advance training in all aspects of irrigation and on-farm management at U.S. universities, (3) encouragement of Egyptian universities to offer more specialized courses in on-farm water management, (4) exchange programs of Ministry of Irrigation personnel with U.S. institutions, (5) education tours by professional staff of the Ministry of Irrigation to U.S. irrigation projects, manufacturers of irrigation equipment and irrigation institutions. These tours should include visits to American style farmer organization, cooperatives, and extension service.

The above paragraphs are general in nature, however, EWUP staff can provide specific information in more details on any of the above recommendations. Furthermore, it will be the objectives of the project in its final two years to provide specific reports detailed findings, information, and recommendations for improvement in the irrigation sector. A figure follows giving a suggested organization for the irrigation sector.

- a. To further the implementation and diffusion of project findings, to review project recommendations and to help plan future project activities it is recommended that the Project Advisory Committee and the P&C Committee meet twice a year as is done by similar Technical Assistance Projects in Egypt. It is recommended that a winter meeting be held in Cairo and a summer meeting be held in Fort Collins.

WATER SYSTEM MANAGEMENT



Decree No. 577 Dated 11/11/81

Issued By

The Chairman of the Board of Directors

Chairman of the Board of Directors.

Considering the Law No. 47 for the year 78, relative to issuing of the ordinance of the State civil personnel;

Considering the Ministerial Decree No. 830 for the year 75, relative to the establishment of the Water Research Center;

Considering the Ministerial Decree No. 307 for the year 78, relative to the issuing of the Executive Regulation of the Center;

Considering the report on the results of the Irrigation Development Project prepared by the Director of the Research Institute of Water Distribution jointly with the Project experts;

Considering what was agreed to in the meeting held in the office of the Minister of Irrigation and of State for the Sudan Affairs;

Considering the approval of the Ministry's Senior Under-Secretary of State and Chief of the Irrigation Sector; and

Considering our approval,

Decide:

Article I:

A first committee shall be formed of:

- The Director of the Research Institute of the High Dam Side Effects,
- The Under-Secretary of State for Giza Governorate, Ministry of Irrigation,
- The Director of the Research Institute of Water Resources Development,
- The Director of the United Nations' Project,
- The Director of the Hydraulic and Sediment Researches Institute.
- The Director of the Soil Mechanics and Foundations Research Institute,
- The Director of the Mechanical and Electrical Researches Institute,
and
- The Director General of the Kafr El Sheikh Irrigation.

Article II:

A second committee shall be formed of:

- The Director, Research Institute of Water Distribution and Irrigation Methods
- The Under-Secretary of State for Garbia Governorate, Ministry of Irrigation,
- The Director, Underground Water Researches Institute,
- The Director, Drainage Researches Institute,
- The Director of the Research Institute of Canals and Drains Maintenance and Weed Control,
- The Under-Secretary of State for Minya Governorate, Ministry of Irrigation,
- The Director of Survey Researches Institute,
- The Director-General of Giza Irrigation, and
- The Director-General of El Minya South Irrigation.

Article III:

The First Committee shall be responsible for reviewing the reports of the Irrigation Development Project, discussing such reports and make recommendations with regard to:

- Delivery system improvement,
- Irrigation by gravity,
- Continuous flow in branch canals,
- Irrigation advisory service, and
- Training

Article IV:

The Second Committee shall be responsible for reviewing the reports of the Irrigation Development Project, discussing same and making recommendations with regard to:

- On-farm irrigation,
- Farmer organization,
- Monitoring service,
- Pilot project, and
- future researches

Article V:

The Committees shall finish their work and submit their final reports within one month as from date this Decree is issued. For performing their work, they shall have the right to solicit the help of anyone they assign.

Article VI:

This Decree shall come into effect as from date of its issue and all those concerned shall put it into execution, each in his concern.

Dr. Mahmoud Abu-Zeid
Chairman, Board of Directors
11/11/1981

Copy to:

The Director, Research Institute of Water Distribution and Irrigation
Methods (Speaker of the Committee), for information.

Moustafa Mohamed Zaki
Director General,
Financial and Administrative
Affairs

Letter of Agreement Between MOI/GOE, CID

And SRP

A. General

For some time the Ministry of Irrigation of the Government of Egypt (MOI/GOE) through the Egypt Water Use and Management Project (EWUP), the Salt River Project (SRP) and the United States Agency for International Development (AID) have been in communication with each other through the 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 in passing on some of the management, irrigation and water scheduling techniques they had developed over the past seventy-five years to MOI/GOE. It is proposed here that an understanding between the parties concerned be signed and that the initial exchange be initiated in 1982. This exchange program will be for a two-year period to coincide with the Consortium for International Development contract completion.

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, to maintain the irrigation delivery system and to gain an understanding of American surface irrigation techniques, farmer organizations and management.

Salt River Project is a self-governing 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-profit organization, a cooperative association and Federal Reclamation Project. Its purpose is to serve approximately 250,000 acres (feddans) with dependable water supply for agriculture, municipal and industrial use and electric energy for Central Arizona.

B. Exchange Program

It is agreed that 16 staff from the MOI will be sent to Arizona to work in the SRP and 8 staff members from the Salt River Project will be sent to Egypt to work in the MOI over a two-year period. The first exchange will be two staff from the MOI and two staff from the SRP. The tour of duty in each country will be about eight weeks. The tour for the Egyptians will start with an orientation at the EWUP project in Fort Collins, Colorado, then six weeks working in the SRP in Phoenix, Arizona and one week to briefly study specific irrigation equipment, suppliers, districts or related facilities in Arizona and southern California. The Egypt tour for the Americans will start with an orientation program at Fort Collins, Colorado, a visit to the EWUP project in Cairo then six weeks working in the MOI in Egypt and one week to briefly study specific irrigation areas in upper, middle and lower Egypt.

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 Irrigation Directorate will be given highest priority.
- b) They should exhibit a fair level of English language proficiency (Min. of 60 on Aligu).
- c) Capable and willing to work on-the-job with SRP personnel in the office and field.

2. For selection of SRP exchangees:

- a) Highly skilled in a particular area, such as, water scheduling, canal maintenance, water operation and management, telemetering, communications, etc.
- b) Capable and willing to work on-the-job with MOI personnel in the office and field.

D. Termination of Exchange Person

Any exchangee, 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 and interstate transportation will be furnished through the EWUP project from funds provided from this project according to AID regulations (AID Handbook 10, and U.S. Standard Travel Regulations).

Local transportation during official duty will be furnished by the respective host agency. Official travel to areas which require transportation will be furnished or reimbursed by EWUP. However, private transportation is the responsibility of individual participants.

F. Per Diem

Per diem will be paid by CID according to AID government regulations. These regulations will be furnished to both parties.

G. Salaries

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

H. Insurance

The MOI employees will be covered under AID's health and accident coverage (HAC). CID will enroll the exchangees and pay for the cost.

SRP Employees

SRP employees will maintain their own health and accident insurance.

I. The Designated Coordinator/Contact Person

The following are the designated coordinator/contact persons:

SRP Phoenix	Mr. Reid Teeples	Telex 667-318	Tel. 602/273-5371
MOI Cairo	Dr. M. Abu-Zeid	Telex 94014 (EXWAPUN)	Tel. 760474
AID Cairo	Mr. Neil Dimick	Telex 93773	Tel. 28219, 774 666 (Ex. 423,206)
EWUP Cairo	Dr. G. Quenemoen	Telex 93773	Tel. 759674
EWUP Fort Collins	Dr. E. V. Richardson	TWX 910 930 9000	Tel. 303/491-8656

J. General Provisions and AID Regulations

All participants are governed by the General Provisions of the CID-AID contract, AID regulations, Standard Government Travel Regulations and AID's Handbook 10 as they relate to accountability, travel, use of medical facilities, U.S. Embassy facilities, etc.

K. Reports

Each participant (Egyptian and American) will submit a report on their training activities with their recommendations to improve the program to SRP, MOI, CID and AID.

L. Orientation

Up to one week of orientation will be provided to the MOI personnel in Egypt and to SRP personnel in Fort Collins prior to departure.

M. Termination of Program

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

N. Approval of Program

This Letter of Agreement has been approved and signed on November 23, 1981 in Phoenix, Arizona.

M. A. Samaha
Eng. Mohamed AbdEl Hadi Samaha
Minister of Irrigation and
Minister of State for Sudan
Affairs

Arab Republic of Egypt

Karl F. Abel
Mr. Karl F. Abel
President
Salt River Project
Phoenix, Arizona

Dr. E. V. Richardson
Dr. E. V. Richardson
Campus Coordinator
Egypt Water Use and Management
Project
Colorado State University
Ft. Collins, Colorado

John L. Fischer
Dr. John L. Fischer
Executive Director
Consortium for International
Development
University of Arizona
Tucson, Arizona