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Egypt Water Use and Management Project
Report
1981 Field Trip
to
Observe Irrigation Practices
in
Southwestern United States

J. D. Redgrave
Training Coordinator

OFFICE MEMO

TO: E. V. Richardson

Date October 12, 1981

FROM: D. J. Redgrave *D.J.R.*

SUBJECT: Evaluation of 1981 EWUP Study Tour of
Irrigation in the southwestern United States

REMARKS:

The 1981 study tour took place from July 28 to August 19, 1981 for a total period of 22 days. The study sites and activities were similar to those of previous years.

The tour itinerary is attached and the following list will give an outline of the major activities at each stop.

1. Washington, D.C.

Rest stop and free day for site seeing.

2. Fort Collins, Colorado

Tour orientation and organization. Visits to C.S.U. departments and individual visits with faculty. Introduction to irrigation and agriculture in the western U.S.

3. Grand Junction, Colorado

Agricultural, water management and water quality (salt control) research and development. Begin study of irrigation management of the Colorado River System.

4. Page, Arizona

Tour of multi-purpose dam and reservoir facilities. Overview of Colorado River Development Project. Allocation of water for multiple purposes.

5. Phoenix, Arizona

A. Salt River Project - tour of facilities and study of operation of a well organized demand type irrigation project. Organization of water allocation and delivery from ditch riders at farm level to flow control from the main reservoir. Total efficient utilization of scarce water supplies and multiple use allocations and coordination.

B. U.S.D.A. Water Conservation Lab - study of the activities and operation of the many research projects conducted by the laboratory. Irrigation timing, water recycling (municipal to agricultural) and reclamation, water flow measurement, salt control, level basin irrigation research.

6. Yuma, Arizona

A. Welton-Mohawk Project - Irrigation water management and salt control, ground water pumping and Irrigation management Integration for water table and water quality control. Farmer demand system with project Irrigation scheduling service. Level basin in commercial applications.

B. Hillander "C" Farming Company - Private new lands development with sandy soils and high potential E.T. Rates. Efficient use of available water. Conversion from flood/furrow Irrigation to sprinkler and drip systems. Farmer application of research to decrease use of water (approx. 50% reduction).

7. San Diego, California

A. Small scale vegetable growers in an urban development area. Use of municipal water supplies for irrigation. High crop yields under intensive management on marginal soils.

B. Steep land Irrigation for tree crops using drip Irrigation. Utilization of climatic zones with very rocky ground, steep slopes, and marginal soils. Irrigation technology allowing expansion of crop production into new areas.

8. U.S.D.A. Salinity Lab - Tour of facilities and research activities of the major salinity research station in the U.S. Discussions with staff about research activities, organization, results and applications.

At the end of the tour, the participants were asked to provide an evaluation. Much of this was written in Arabic and translated.

The general consensus was that the tour is very valuable. The activities at the study sites provided the trainees with fresh insight into the field of Irrigation water management and gave them many new ideas that might have applicability in Egypt. Level basin Irrigation, lined canals, farmer demand systems and the organization to operate the system, Irrigation scheduling by evaporation pans and soil moisture measurements, water recycling, and water table control by ground water pumping and Irrigation management were the items that received particular praise. New ideas and techniques of water control (main system), water measurement, salt control, and Irrigation of marginal lands were also cited as important.

Another consideration is also important. The attitude of the trainees changed considerably during the tour. Their prior contact with American specialists was in an advisory role under Egyptian conditions. The advice of project people now has new credibility after the participants have seen accomplishments in the United States. This was not specifically mentioned, but is a quite obvious occurrence and should have important implications for EWUP project activities.

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The only negative comments were that the time was too short. Perhaps the tour can be expanded in time, or more time can be spent at fewer stops. The overall recommendation is that the study tour remain an integral part of the training program. It is a vital part of the training activities and provides great benefit to the participants and to project activities.

DJR:cb

enclosure

**Participants U.S. Field Trip
1981**

Senior Officials

Eng. <u>Atia Omar Atia</u>	Under Secretary of State for Ministry of Irrigation, Assuit
Eng. <u>Fathy Abdel Haliem</u>	Under Secretary of State for Ministry of Irrigation, El Minya
Eng. <u>Salah El Din Hassan</u>	Under Secretary of State for Ministry of Irrigation, Beni Suef & Fayoum
Dr. <u>Baligh Shindi Zikri</u>	Director, Soil and Water Research Institute
Dr. <u>Elwy A. R. Atalla</u>	Director, Plant Protection Research Institute
Eng. <u>Mohamed A. M. El Zeftawy</u>	Director General of Irrigation, Gharbia
Eng. Mohamed Mahmoud <u>El Malkh</u>	Irrigation Inspector, MOI, Cairo

**Participants Egypt Water Use and Management Project
Water Management Short Course**

Agr. Ahmed Tahoon	EWUP - Mansouria
Agr. Ahmed Sayed Ismail	EWUP - Kafr El Sheikh
Agr. Hanafy Mahmoud Hanafy	EWUP - Mansouria
Agr. Mahmoud Khedr Afifi	EWUP - Mansouria
Agr. Salah Saleh Abdel Samie	EWUP - El Minya
Econ. Abdel Sattar Shineshan	M.O.A. - Agr. Economics Institute
Econ. Ahmed Mohamed El-Shater	M.O.A. - Agr. Economics Institute
Econ. Sobhi Ahmed Elewa	EWUP - Kafr El Sheikh
Eng. Abdel Razek Ismail Hashim	M.O.I. - Aswan
Eng. Adel Mohamed El-Kholy	M.O.I. - Gharbia
Eng. Ahmed Abdel Naiem Abdel Ghany	EWUP - El Minya
Eng. El Quaqua Mossad Megahed	M.O.I. - Gharbia
Eng. El Sayed Mohamed Ahmed Hassan	M.O.I. - Giza
Eng. Essam Menoufy Mohamed El-Sayed	M.O.I. - Quena
Eng. Fathi Aly Solieman	M.O.I. - El Minya
Eng. Kadry Ahmed Osman	M.O.I. - Giza
Eng. Mohamed Abdel Moniem El-Etefi	M.O.I. - Quena
Eng. Mohamed Salama El-Shafee	M.O.I. - Kafr El Sheikh
Eng. Mohamed Shebl Abdel Aziz	M.O.I. - Gharbia
Eng. Mostafa Abdel Ghany Sakr	M.O.I. - Gharbia
Eng. Saad Shehata Abdel Al	M.O.I. - El Minya
Eng. Tarief Fahmy Abdel Rahman	EWUP - Mansouria
Eng. Wadie Ragy Kelada	EWUP - Institute
Soc. Ahmed Gamal El-Din	M.O.A. - Agr. Extension and Rural Development Research Institute
Soc. Mohsen Bahgat Mohamed	
Soc. Saber El-Sabbagh	

Study Tour 22 Days

<u>Day</u>	<u>Travel</u>	<u>Accom.</u>	<u>Activity</u>
July 28 Tue.	Cairo - D.C.	Washington, D.C.	
29 Wed.		Washington, D.C.	Tour of D.C.
30 Thu.	D.C. - Ft. C	Fort Collins	Free Day
31 Fri.		Fort Collins CO	B.O.R. - Denver - Farms
Aug 1 Sat.		Fort Collins	Big T - Rocky Mountain
2 Sun.	Ft. C-G. Junc	Grand Junction	Stop in Vail
3 Mon.		Grand Junction	Grand Junction Area
4 Tue.	G.J.-Page	Page AZ	
5 Wed.	Page-Phoenix	Phoenix	Tour Glen Canyon Dam
6 Thu.		Phoenix	Salt River Project
7 Fri.		Phoenix	U.S.D.A. Water Cons. Lab
8 Sat.		Phoenix	Free Day
9 Sun.	Phoenix-Yuma	Yuma	Afternoon Free
10 Mon.		Yuma	Welton/Mohawk
11 Tue.	Yuma-San Diego	San Diego	Level Basin
12 Wed.		San Diego	Veg. Crops
13 Thu	S.D.-Riverside	Riverside	Steep Lands Irrigation
14 Fri.		Riverside	U.S.D.A. Salinity Lab
15 Sat.		Riverside	Disneyland
16 Sun.		Riverside	Free Day
17 Mon.	Los Angeles	(Paris/Rome/New York)	
18 Tue	Cairo		
19 Wed.			

I am fond of all the project and all forms I visit in our tour. All of them show me the power and progress of U. S. A. I am more admired with GLEN CANYON DAM and power plant construction which was built 1955-1966. It is a great project to control the river water for irrigation and for electricity power. More cultivated land depends on the dam which irrigates by different kinds of irrigation. I am also admired of Salt River project and the different constructions on the river for sedimentation and for decreasing salinity of water and more crops depend on this project. I am fond of all farms I visited using sprinkler irrigation and drip irrigation. The better farm I visit is (Irvine family, farm) which I visit on 8/14/81. The drip irrigation of surface of mountain for avocado trees and the vegetables farms and different kinds of trees. The pipes of drip irrigation are more durable and the system is very good. For I glad that I am one of those who comes this over and I hope the continuity of this tour to make a large base for Engineers and Agronomists in U.S.A. and Egypt for civilization in progress.

By the Name of the God

Introduction:

The tour started July 27, 1981 and ended August 17, 1981 and we will be in Cairo August 18, 1981. Stops were in Washington, D. C., Fort Collins, Grand Junction, Page, Phoenix, Yuma, San Diego, Riverside.

The important things in the tour:

It can be summarized in visiting different irrigation projects which is very important for the Egyptian side to use this technology in Egypt.

A. Salt River Project

The irrigation system in this project is exactly the same system used in Egypt which is almost surface irrigation except.

Using the computer for controlling the amount of water in the canal and watching the emergency case like flood or shortage of water in some places which can solve the problem immediately and the high technology system for operation and maintenance of canal and using lining canal give good management and use of water.

B. U.S.D.A. Salinity Lab

This is the research center for salinity and they did excellent work in this field which were very interested to me, e. g., they studied the possibility for using salt water in irrigation, they used fresh water and sea water 1:1 ratio.

They also studied the sandy soil for special crops which will be good for solving the world problem in this field.

This trip gave me a good feeling the Egyptian engineers and scientists can do a good job for Egypt if they learn from the American people.

Notes:

1. The time was short for each place we visited.

2. I suggest that the tour must be divided into subgroups in the places of interest, e.g., dams, project and research centers.

Thanks for everybody

God Help Us to Serve Our Country

Engineer Mohamed El Zeftayee

Tanta Egypt

Eng. Fathi Aly Solimam

We gained much education benefits from our visit to U.S.A. The most benefits visits are:

1. Canyon Dam - We took a wide idea about how to store water and how the electric power station works by turbines.

2. Salt River Project - We took a wide idea about the successful arrangement of work in this project which gave us a good idea about the recent technology in operating and distribution irrigation water to canals automatic and how the best control electronic in every big or small things concerning everything especially levels of water elevations of water until the day in every canal and the requirements of irrigation water at each field and every position on the canal. This is a very good example for successful project, we took a big benefit from it.

3. The Visit of the Dam at the Boundary Between U.S.A. and the Mexico which organize the division of irrigation water between the two countries also how to regulate the percentage of saline delivered from U.S.A. to Mexico.

4. Steep Lands Irrigation - This project gave us a new idea about drip irrigation and how to make the irrigation water be filtered to prevent any strage and dirty things goes to the cultivated lands by irrigation water, i. e., filtering and cleaning irrigation water before giving it to the farm. Also we took a wide idea about the high stand mechanism of how drip irrigation works since the irrigation water from its source until delivering irrigation water to the plant in sufficient quantities.

5. Irvine Ranch - We took a good idea about the best management of a big cultivated area and the different benefits from this project: yield, civilization, recent mechanism in irrigation and in cultivate the land and collecting the yields.

6. U.S.D.A. Salinity Lab - We took a broad idea about how to make different experiments in lab to decide the effect of saline water on the yield at different percentage. We also took a good idea about the suitable irrigation. Water the plant needs which do not effect in increasing the percentage of saline in soil. Sorry if I cannot able to explain what I mean exactly.

A Report On
EWUP Summer 81 Tour

Good Observations

The automatic control in irrigation works, beginning from dams to turnouts to the fields.

Applying canal lining for all irrigation channels.

Making use of every drop of water, in such a way that no water goes to the sea.

This is in addition to preparing to receive excessive amounts of runoff resulting from severe storms.

Using the falling water from dams more than one time in generating electricity by means of lifting it again to the reservoir during the period of low load.

Making use of artificial lakes D.S. dams in fishing and recreation.

The reuse of sewage water in irrigation.

The large propriates which enable using machinery in agricultural operations.

The laser levelling of the lands, in order to increase the uniformity of water distribution and irrigation water application efficiency.

Adopting drip irrigation because of the shortage in irrigation water available and also in sloping areas.

Using automatic controllers in drip irrigation scheduling.

Experiments done on using saline water in irrigation.

The decrease of food all over the world is a main problem that makes many countries began to deal with U.S.A is one of these countries. As plants, agriculture water are principles of food then a special program is made between U.S.A Fort Collins, Colorado University and Egyptian EWUP to make something in this field. A principal phase in this program is the scientific tour for some special peoples to U.S.A. It was a sufficient one to see many projects and special farms and dams and irrigation barrages.

The different between some styles in managing and dealing with many problems in U.S.A. gave us a good idea for trying the better, e.g.:

1. Salt River Project

- a. How it is controlled
- b. Combining the directors of project with those who are using water or electric
- c. Reusing and controlling every drop of water

2. The Up-To-Date Ways of Irrigation

- a. Drip irrigation in many places and how it is used in different levels
- b. Furrow irrigation by using some kind of pipes
- c. Sprinkler irrigation and how operating the system

3. Meeting and Dealing with America

This was a very important one although the language was difficult somewhat but I think that it is a very good chance especially with engineers and scientific news.

At the end there are some points to try to make the better:

1. The time spend in bus from place to place.
2. The time of visiting to be in early morning.
3. Required more especially for places to know more.

At last many thanks for Colorado University and U.S.A. and we hope to make more contact with Egypt and Egyptians.

EWUP Summer 81

Evaluation of Tour Contacts

Agr. Research Center - Grand Junction

It is very useful visit, but its period is not enough. The farms of modern surface irrigation - Grand Junction. It is very important and useful to us, but it must repeat five times in several farms at several conditions.

Salt River Project - Phoenix

We visited canals, dams and computer of control center. But it is very useful to us if we understood the computer's idea before visiting it.

U.S.D.A. Water Conservation - Phoenix

The usefulness of this visit is limited, because we saw some pictures of experiments without seeing the results in the commercial farms.

Wolton Mohawk Project - Yuma

It is useful visit, but we were needed to some one more satisfied to explain the experiments and the methods of irrigation.

Irrigation District Farms - Yuma

It is very useful visit to us.

Steep Land Irrigation - San Diego

It is useful and necessary to know this method of irrigation.

Irvine Ranch Farm - Riverside

It is useful, but the previous visit to steep land irrigation was enough, because this method of irrigation is not used and will not be used in Egypt for its more expensive.

U.S.D.A. Salinity Lab - Riverside

It is very useful visit. Then I can brief my recommendation in some following matters:

1. The period of this tour is not enough, and must be double.
2. Visiting more states to see the methods of irrigation.
3. Visiting more farms which use modern surface irrigation.
4. Visiting more research centers.
- 5: More staying in Colorado University especially Agronomy, Economics, Engineering and Sociology sections and visiting the library to hold some important books.

Then I thank everyone help in this tour and thank very much the tops of EWUP in Egypt and U.S.A.

Economist Ahmed M. El Shater
Agricultural Economic Research Institute
Ministry of Agriculture, Cairo

Report About How Important This Tour to People Who are Specialist in Agriculture Field

No doubt that this kinds of visits are very useful to us because of the lectures and projects in the program in different field. It's essentially for engineers to see the improvement of irrigation systems and crops in other countries like U.S.A. which is useful to us to increase food and fibers in our country.

The important projects that we can use the same techniques in our country is:

1. Salt River Project

About this project: It is multi objectives project, it started in 1902 under the federal government of U.S.A. It covers 250,000 acres what is useful to us in this project? Is the high technology control of water and the way of watching the amount of water coming to the valley. The purposes of this project are:

1. Controlling and distributing the water in the canals. It is very good idea to make a training program for the Egyptian engineers in this project.

2. Project for controlling salinity in Colorado river. These kinds of project are very interesting especially the Mohawk Welton project which reduces the salinity in the water from Mexican government share. No doubt this project gives us the idea to start making project to increase the quality of river mile.

The Third Important Project is the Different Irrigation Systems:

During the tour we saw different types of irrigation systems, e. g., drip irrigation, sprinkler irrigation and the new system called cable gation system which works mainly for complete control for the water which is suitable

for the salty land or for the land where there is shortage in water.
Finally this the important things which were interested to me without
ignoring the other important subjects in the trip.

No Name

**My Comments on the Tour of Developing
the Irrigation Systems in U.S.A.**

My suggestion to Egypt and U.S.A. to cooperate and adopt the following projects.

1. Project for solving salinity problems in Egypt.
2. Project like Salt River Project by considering the way for selling water and services to the farmer. Also I suggest to send the Egyptian engineer to this project in training program to use these people in adapting the system in Egypt. This project can be used in the new land.

I believe this trip was very useful for the Egyptians to see the irrigation system in U.S.A. I hope this program will continue.

No Name

Report for the period from 7/28 to 8/18/81

This report concentrates on the useful points:

1. The applied of different types of irrigation systems, e. g., surface irrigation, drip irrigation, sprinkle- irrigation and the way of selecting the system according to kind of soil and source of water and crop.
2. Taken in consideration in selecting the irrigation system the salinity problem.
3. Using of computer to determine irrigation period and required amount of water.
4. The distribution of water by using the computer to give the required amount of water in canals at the proper time.

No Name

Comment on the Engineers Tour to
U. S. A. in the period from 7/29 - 8/17/81

I hope that this kind of visit continues periodically to U. S. A.
for the following reasons:

1. Improve experience of engineers who work in the places in increasing the application efficiency of water.
2. To see and study in the field the drip and sprinkler irrigation systems which are used widely in U. S. A.

Points of Interest in the Tour:

1. Salt River Project but the time for visiting this project was not enough.
2. U. S. D. A. Salinity Lab is the most important project we saw in the tour especially their works studying the crops that can grow in salt water.

Points I Do Not Like in the Tour:

1. The program was full and hard for short time and everyday.
2. We did not get the chance to see the places of interest for the foreign people in each city we saw.
3. The repeated visit to one system of irrigation in the drip irrigation system I think once is enough.
4. For long trip like this the bus is not good.

No Name

Report About Advantage And
Disadvantage of the Tour In U. S. A.

A. Advantage

1. I enjoyed the way that the American used in distributing the water by using the computer. Also I am interested by the central of opening the gates in the small canals and the management of giving the required amount of water to farmer in the time needs the water.

2. The using of sprinkler irrigation for different crops which is a good system for saving water and good for using groundwater.

3. It is a good job to use drip irrigation especially in big areas which have not sufficient water is a good irrigation system for increasing crops by using the groundwater.

4. The private sector in U. S. A. is a good example for using big farms which can help for using advanced equipment and give good management which we need in Egypt.

B. Disadvantage

To use bus in this trip is very hard. By using airplane in this trip can save much time which can be used in visiting many places.

Name Engineer M. El Malch

No doubt to see new high technological techniques in irrigation field give us new information which we need now in developing our system in Egypt. No doubt we need to see these things in U.S.A. because we are going to use these methods in the new land.

I am proud by the power plant in canyon dam especially the automatic control for the plant.

The Salt Lake Project is very interesting project especially the way of managing the water in the courses and in the main canals. It is good example for water use and management which we need in our system in Egypt.

This project is a good example for increasing food and fibers which is a good solution to our problem in Egypt.

No doubt comprehensive program in the tour has some difficulties as example:

1. Using the bus in this tour for a long distance is very hard It is better to use flight.
2. We hope the tour ends in Fort Collins to discuss together with the people whom in charge in preparing this tour to exchange the ideas.
3. We prefer to have longer time in each place to study these interesting things.

I am interesting by the drip irrigation whatever I saw it before in France (Paris). Thanks God

Evaluation to the Use and Management of Water Tour

CSU extension in Grand Junction:

We saw the different experiments on crops and seeds which are useful to U.S. but the time was not enough.

Corn Parent Fields in Grand Junction:

We saw the corn parents fields also we saw the lining canals in this area which was useful to us we hope more of these kinds of tours.

Salt River Project:

We saw the great job in this project which was very important to us but we hope before the tour starts we can study the theory of the project at C.S.U.

U.S.D.A. Water Conservation Lab:

To a certain limit we get some knowledge in this station but we hope if we can know what about the application of the studies in the application field.

Drip Irrigation in Yuma:

We got good knowledge in this part of our tour especially in using center pivot system in alfalfa and drip irrigation for trees by using groundwater.

Irvine Ranch:

It was interesting to use drip irrigation in raising avocado but to repeat this system in the tour is not useful especially this system is not used in Egypt. It was enough to see it once.

Suggestions

1. Increase the time of the tour.
2. Increase the number of research centers.
3. Extend the time in Fort Collins to see C.S.U. and to have the chance to visit the different departments in C.S.U. and to have the chance to buy some books from the bookstore.
4. Increase the visits of surface irrigation places.
5. Visit more states in U.S.A.
6. We need much fun in the tour program.

Finally thanks to everybody joined us in this tour Egyptian and American.

Economist Ahmed El Shater

Elkholy Abdel Moh

8/14/81

1. The visit to Colorado State University was very interesting to make sure with the American and Egyptian relations.

2. Good welcome for all the trainers so that make all of us happy in the period of Ramadan month and feast day.

3. The Salt River Project is a very wonderful project because of the distribution of water through lined canals and the electronic control of gates that makes the project successful one that helps Engineers in giving the required water for each land quickly and in fixed time.

4. Feasibility of Irrigation project such as making dams and reservoirs along Colorado River to utilize water.

5. Drip Irrigation is a good system to save water and to give uniform distribution for fertilizers.

6. Riverside lab of salinity shows us a good information to utilize the drainage water mixing with Irrigation water for some selected crops.

At the end of the trip we salute all the staff of American and Egyptian trainees that give us more information to help us in our different places especially Dr. Redgrave, Dr. Yack Moseley, Dr. Sallam and all of the American people.

Report

Submitted for the training tour in U.S.A. for period from 7/28 to 8/17/81, no doubt that the things we saw in this trip is a wonderful and the trip had a good things which I concentrated here as following.

1. The useful lesson in this trip is that they use each drop of water we can say no waste water. This system forces us to study our system and redetermine and evaluate our calculations in this field for our lovely Egypt.

2. The most attraction system in this trip was the drip irrigation system, which makes us to think deeply in our water from the Nile which is the valuable thing that Egypt has.

3. Sure we had got a good experiences in cultivating the irregular high elevation land.

No Name

Report on the Tour

CSU Research Station In Grand Junction

We had a good chance to learn in this station the crops factors from quick look and from the explanation for this factors. We also saw the different type of Irrigation system used in this station. It was interesting to see the corn parents field.

Salt River Project

We studied and knew how they used the computer in this project in controlling the irrigation periods and required amount of water.

The Irrigation Systems in Yuma

We saw the dams and the power stations and the drip irrigation system.

Salinity Lab

We saw and taught to much about the activities of this lab in different fields, e.g. the different experiments and crops, decreasing salinity in irrigation water.

We got the chance to see the drip irrigation. The time was very short for this trip.

Suggestions

Increase the time for this trip. Whatever it was a great tour to see the American technology in this field.

Sociologist Saber El Sabagh

By the Name of God

Really It is useful to all engineers in Ministry of Irrigation to visit U.S. A.

It was very important to see different project in our field like the projects on Colorado River especially in Grand Canyon the power plant. Also the Salt River Project was very interesting to us especially the control system used in this project.

In the field of water use and management we saw different systems especially surface irrigation, sprinkler irrigation and drip irrigation which is used for fruits.

In other side I enjoyed very much design land.

No Name