Project Paper Supplement

Egypt - Water Use and Management

263-0017

AGENCY FOR INTERNATIONAL DEVELOPMENT

# PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete) | Amendment Number: 1 | DOCUMENT CODE: 3

2. COUNTRY/ENTITY: Arab Republic of Egypt

3. PROJECT NUMBER: 263-0017

4. BUREAU/OFFICE: Near East

5. PROJECT TITLE (maximum 40 characters): Water Use and Management

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM DD YY: 0 6 3 0 8 4

7. ESTIMATED DATE OF OBLIGATION (Under "B." below, enter 1, 2, 3, or 4): A. Initial FY 7 6 | B. Quarter 2 | C. Final FY 8 4

8. COSTS ($000 OR EQUIVALENT $1 = )

| A. FUNDING SOURCE | FIRST FY B. FX | FIRST FY C. L/C | FIRST FY D. Total | LIFE OF PROJECT E. FX | LIFE OF PROJECT F. L/C | LIFE OF PROJECT G. Total |
|---|---|---|---|---|---|---|
| AID Appropriated Total | 1500 | | 1500 | 13,000 | | 13,00 |
| (Grant) | ( 1500 ) | ( ) | ( 1500 ) | (11,940 ) | ( 1,060* | ( 13,00 |
| (Loan) | ( ) | ( ) | ( ) | ( ) | ( ) | ( |
| Other U.S. 1. U.S. Owned | | | | | 2,229 | 2,22 |
| Other U.S. 2. | | | | | | |
| Host Country | | 554 | 554 | | 4,756 | 4,75 |
| Other Donor(s) | | | | | | |
| TOTALS | 1500 | 554 | 2054 | 13,000 | 8,045 | 19,98 |

9. SCHEDULE OF AID FUNDING ($000)

| A. APPROPRIATION | B. PRIMARY PURPOSE CODE | C. PRIMARY TECH. CODE 1. Grant | C. PRIMARY TECH. CODE 2. Loan | D. OBLIGATIONS TO DATE 1. Grant | D. OBLIGATIONS TO DATE 2. Loan | E. AMOUNT APPROVED THIS ACTION 1. Grant | E. AMOUNT APPROVED THIS ACTION 2. Loan | F. LIFE OF PROJECT 1. Grant | F. LIFE OF PROJECT 2. Loan |
|---|---|---|---|---|---|---|---|---|---|
| (1) SA | 123B | 064 | | 7,000 | | 6,000 | | 13,000 | |
| (2) US | Owned | | | 1,560 | LE | | | 2,229 | |
| (3) | | | | | | | | | |
| (4) | | | | | | | | | |
| TOTALS | | | | 7,000 | | 6,000 | | 15,229 | |

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

11. SECONDARY PURPOSE C

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code

B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

1. Research, develop and demonstrate replicable water management practices which will (a) increase the efficiency of the irrigation system and (b) increase agricultural growth.

2. Increase institutional capacity to develop and sustain an improved on-farm water management program.

14. SCHEDULED EVALUATIONS: Interim MM YY: 0 7 7 9 | MM YY: 1 1 8 0 | Final MM YY: 0 6 8 3

15. SOURCE/ORIGIN OF GOODS AND SERVICES: ☐ 000 ☐ 941 ☒ Local ☐ Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a ____ page PP Amendment)

This amendment provides funding to extend the contract to permit achievement of original project goals.

*$1.06 million worth of Egyptian pounds purchased for project local support.

17. APPROVED BY

Signature: [signature]

Title: Director

Date Signed: MM DD YY: 0 6 1 1 8 1

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM DD YY: 0 6 0 8 8 1

AID 1330-1 (8-79)

TABLE OF CONTENTS

I. Summary and Recommendations:

A. Grantee: The Government of the Arab Republic of Egypt (GOE).

B. Implementating Agency: Ministry of Irrigation, Water Research Center, Water Distribution Institute.

C. Grant Amount: This project paper supplement seeks additional funding of $6.0 million of which an estimated $1.06 million will be for local currency requirements. The original project and its various funding amendments total $7.0 million and 1.56 million U.S.-owned Egyptian Pounds. Thus the proposed life- of- project funding totals $13.0 million and 1.56 million U.S.-owned local Egyptian Pounds for a total dollar equivalent value of $15.229 million for the U.S. contribution.

D. Project Goal: Improve the social and economic conditions of farmers.

E. Project Purpose(s):

1. Research, develop and demonstrate replicable water management practices which will (a) increase the efficiency of the irrigation system and (b) increase agricultural growth.

2. Increase institutional capacity to develop and sustain an improved on-farm water management program.

F. Purpose of the Project Paper Supplement:

Drawing from progress to date with the project and actual costs of carrying out operational field research and from the findings of an external mid project evaluation the project supplement is to: (a) extend the life of project by 1.5 years and (b) increase Life of

Project (LOP) funding. The original goal, project objectives, outputs and inputs remain the same although the purpose statement wording has been modified to clarify the objectives of the research/demonstration effort.

G. Project Description:

1. Irrigation Practices

Through adaptive research/demonstration, the project will develop and test a set of irrigation water management practices which can be adapted in the Nile Valley and Delta. The Project will work with small farmers in three pilot areas to adopt water management practices to increase agricultural production and water use efficiencies and decrease drainage problems. The Project will be conducted with the Water Distribution Research Institute, Ministry of Irrigation and with some personnel assigned from the Ministry of Agriculture.

2. Institutional Development

The substance of the research agenda for the Water Distribution Institute will be primarily identified through actual research experience, farmer feedback and demonstration results. The information requirements of the Ministry of Irrigation will, of course, also affect the work plans of the Institute. End of project status will be an institute capable of identifying relevant MOI and farmer needs and carrying out research and prototype demonstrations which provide operationally useful information.

The institute will identify both "hardware" equipment for improving the efficiency of irrigation, i.e., engineering, redesign of portions of the system, and "software", i.e., needs for irrigation specialists and farmer organizational specialists in the agricultural/irrigation sector. In addition, the institute will identify the user of the "hardware" and "software" in the MOI, farmers and start the transfer of technology to these users.

H. Financial Plan:

1. Total Project Cost

Total GOE and U.S. project costs in both foreign exchange and local currency is estimated at $19,985 million equivalent. AID financing will total $15.229 million equivalent, including L.E. 1.56 million (equivalent to $2.229 million) provided in FY 1977 from then available U.S.-owned excess foreign currencies.

To date dollar project authorizations total $7.0 million. The addition funding proposal is for $6.0 million. Because of the need for L.E. to cover local currency costs of the project and since excess U.S.-owned foreign currency is no longer available, up to $1.06 million of the $6.0 million will be used to purchase L.E. The GOE ministries will provide the balance of project funding in local currency and goods and services. Their contributions in the first four years of the project thus far are estimated at a minimum L.E. 1.95 million ($2.786 million equivalent). The financial plan

provides a detailed budget proposal for the project and including those activities carried out and planned.

2. Grant Application:

The GOE has requested USAID/Egypt to provide the additional funds to complete the five year project. The letter requesting the assistance is enclosed as ANNEX II.

3. Mission Views:

USAID/Egypt recommends authorization of the increased funding and time extensions set forth in the attached documents. The principal officer's certification of the project pursuant to Section 611(e) of the Foreign Assistance Act of 1961, as amended, is shown as Chapter X, Conclusions.

4. Source of U.S. Funds:

Fiscal Year 1981 Economic Support Fund.

5. Pipelines:

The original project, with its amended Project Activities Completion Date (PACD) date of December 31, 1982, and its current rate of expenditure, is presently short funded by about $ 1.5 million dollars. Hence even without the level of project supplement proposed herein there is a need for additional LOP funding. Implementation planning, staffing and programming of current work require an early decision regarding the supplement.

The supplement could be fully or incrementally funded and the funds could be provided from FY 1981 or from early FY 1982 funds. Life of project funding is recommended. If overall program pipeline management considerations indicate a need to withhold FY 1981 obligations at least a FY 1981 project supplement authorization is recommended. Given that current rate of expenditure is about $2.5 million per year and the need to process the authorization in FY 1981, it is further recommended that funds be provided in FY 1981.

I. Statutory Requirements.

All statutory requirements have been met. See ANNEX V.

J. Environmental

The Environmental statement attached as part of the original project paper determined, in effect, that no issues existed with respect to the environment and that no further environmental assessment would be required. This situation still remains.

K. Recommendations

USAID/Egypt recommends that an authorization amendment be approved which will bring the life of project funding $13.0 million and L.E. 1.560 million on terms and conditions as set forth in the draft authorization amendment which is ANNEX IV.

II. Background

The project grant agreement was signed in June, 1976 but a contract to implement the project was not signed with CID until May, 1977.

Contractor started activities in June, 1977 with an advance team, and the full complement of eight expatriates were in Egypt by January, 1978. The present project assistance completion date is December 31, 1982, with six months allowed after that date for project expenditures to finalize reports and phase out project activities and personnel.

By the end of 1981, the project provided inputs will total $12.015 million (including LE dollar equivalents) to: (1) develop and demonstrate replicable improved irrigation water management that increase agricultural production, and (2) increase institutional capacity to develop and sustain an improved on-farm water management program. Of this total the U.S. contribution will be $7.0 million and L.E. 1.56 million and the GOE contribution will be 1.95 million LE.

The project is being conducted by the Water Distribution Research Institute of the Water Research Center in the Ministry of Irrigation (MOI). The Soil and Water Research Institute in the Agricultural Research Center, Ministry of Agriculture (MOA) is a cooperating institution. The MOA furnishes project agronomists, sociologists and economists. To round out the needed disciplines of the project the MOI is hiring agronomists, economists and sociologists.

As designed in PP, the applied research and extension program is being conducted in three pilot areas that represent three different soil, climatic, social, agronomic and cropping areas of Egypt. One area, Mansouria, is near Cairo. It grows vegetables, is at the

interface of the desert and the Nile Valley (has sandy soils interlain with heavy clay) and farmers can and do work in Cairo. The second area, Kafr El Sheikh, is near the city of that name in the northern delta. Principal crops are cotton and rice with secondary crops of beans, berseem, corn and wheat. Soils are heavy clay, and drainage and salinity are problems. The third area, El Minya, is in Upper Egypt near the city of that name. Principal crops are cotton, maize, wheat, sugarcane, beans, and berseem. Soils are clay loam, lighter than delta soils. Irrigation is by gravity, lift or combinations of the two. All three areas are representative of much larger regions with similar conditions. Farm size in all project sites is typical for Egypt with average size of about three feddans They also include a few large farms of around 25 feddans (1 feddan equals 1.04 acres).

In each of the pilot areas, project activities are to be implemented in three overlapping and interrelated components:

A. On-farm surveys: The surveys will improve the data base concerning existing farm production and will determine the type of additional research required. This process is designated problem identification.

B. Water Budgets: This component will develop a data base on the quality and quantity of water entering and leaving each irrigation area.

C. Research on improvement of farm application systems: The research will be conducted in 2 stages. Stage one involves an on-farm research program based on components A & B and on results from other agricultural research in Egypt. It will develop optimum combinations of such factors as flow rate, field configuration, infiltration, field leveling, all of which will lead to higher efficiencies. Studies are also to be done on the replenishment of soil moisture and control of waterlogging and salinity. Stage two consists of design and implementation of pilot programs in each of the three areas to test the acceptability and rate of adoption by farmers of improved practices. Of equal importance will be the determination of the most efficient organizational approach or approaches, the technical competence of personnel required and the costs and benefits involved for successful conduct of such programs.

Components A and B are designated problem identification and are to determine the on-farm water management constraints to good agricultural producton. On-farm water management constraints are the social, agronomic, economic, irrigation methodologies and water delivery practices that interact to decrease irrigation efficiency and crop production.

Component C, stage one, is designated as solution testing or searching for solution and is to be on-farm research to determine

the solutions to problem identified in components A and B.

The project was to be implemented in each area in successive six month intervals starting in Mansouria, Kafr El Sheikh and then El Minya. At the end of 2 1/2 years the knowledge gained from the problem identification, water budget and solution testing were to be used to design pilot projects in the three areas for stage two. Pilot projects are defined as follows: At the end of the initial program of testing solutions to the major problems, a number of high-benefit technologies will be offered as a pilot program for a group of farmers in a descrete portion of an irrigated area. Such a program would then be initiated on a pilot basis to test its acceptability by farmers, costs and benefits, and acceptability by the GOE and their rate of adoption.

In the PP, Grant Agreement and CID contract the pilot projects were to be defined in a mid-project report. Also, as stated in the CID contract "At the end of approximately two and a half years a major review will be conducted to determine the elements and organizational arrangements required for the pilot demonstration/production activities to be conducted in the second half of the project." The mid-project report was completed in September, 1980, 2 2/3 years after actual implementation of the project. Delays in the project resulted from the time needed to train an Egyptian staff of agronomists, sociologists, economists and engineers on their discipline roles in on-farm water

management and their roles on an interdisciplinary team. Other delays resulted from the time required to get transport, design data forms and questionnaires and obtain equipment. Also, on-farm agriculture has a season of its own with definite dates of planting and harvesting. Further delays resulted when data collection or starting on-farm research for a crop, missed the planting season. This caused delays of up to a year for particular crops.

The mid-project evaluation was conducted in the fall of 1980. The evaluation stated that "the project should definitely be continued because it is well designed, has had considerable institutional achievements to date and its implementation problems can be overcome." But, the evaluation qualified its recommendation by suggesting that the focus and specifity of the pilot programs should be improved and questioned if the pilot projects could be completed (constructed, field tested and analyzed) in the remaining time. There were also recommendations of additional research that should be conducted during the pilot projects. Consistent with the recommendations of the evaluation team. This amendment proposes to extend the project until June 1984, to maintain CID as the contractor and for project staff to implement their revised work plans.

Project staff in January 1981, through a series of planning meetings, developed a revised work plan for project activities taking into consideration the recommendations of the evaluation team, and the

comments of the Ministry of Irrigation and AID. The work plan matrix which shows a summary of the work plan is inserted on Page 13. USAID staff believe the plan is reasonable and can be accomplished.

III. Major Project Achievements and Findings:

The project has (a) formed, trained and motivated an interdisciplinary water management research team which is field oriented and has excellent rapport with the farmer, (b) established the methodology and acceptability of doing bonafide agro-irrigation research on the farmers' fields and with their cooperation, (c) identified and quantified the major constraints to good on-farm water management, (d) identified and quantified the social, economic and agronomic constraints to increase agriculture production, (e) researched some promising solutions to the problems and (f) developed a work plan for pilot testing a set of irrigation interventions for farmer acceptability, technical and economic feasibility and MOI acceptability.

The major problems that have been identified, quantified and for which some solutions have been tested or for which testing is proposed in the pilot projects are as follows:

A. Poor frequency, amount and uniformity of irrigation water causes over or under-irrigation. The reasons are:

1. Unlevel fields
2. Poor condition of meska (weeds, cross-section)
3. Lack of water (inadequate water supply)
4. Lack of knowledge - farmer, MOI, MCA, personnel

EWUP Work Plan Matrix for

Task Groups & Field Sites

| Central Office Task Groups | MANSOURIA SITE | | | KAFR EL SHEIKH SITE | | | EL MINYA SITE | | | Final Report & Recommendations Date |
|---|---|---|---|---|---|---|---|---|---|---|
| | Hammami Pipeline | Meska #10 | Special Studies* | Manshia Canal | Hammad Canal | Special Studies* | Abueha Canal | Meska #26 | Special Studies* | |
| 1. On-Farm Irrigation | X | X | X | X | X | X | X | X | X | September, 1983 |
| 2. Water Distribution Systems | X | X | X | X | X | X | X | X | X | September, 1983 |
| 3. Farmer Organization | X | X | X | X | X | X | X | X | X | September, 1983 |
| 4. Irrigation Advisory Service, Farm Management & Planning | X | X | X | X | X | X | X | X | X | September, 1983 |
| 5. Water Budget | | | X | | | X | | | X | November, 1983 |
| 6. Land Leveling | X | X | | X | X | | X | X | | September, 1983 |
| 7. Soil Fertility | | | X | | | X | | | X | September, 1981 |
| 8. Soil Characterization | | | X | | | X | | | | January, 1982 |
| 9. Pest & Disease Control | | | X | | | X | | | X | September, 1981 |
| 10. Conjunctive Use | | | | | | | | | | June, 1982 |
| Final Report Date. | June 1983 | April 1983 | Variable | June 1983 | April 1983 | Variable | June 1983 | April 1983 | Variable | |

* Field Trails and studies to provide answers to specific problems such as tail end problems, long furrows, irrigation efficiency, etc.

5. Upstream users taking more than they need
6. Rotation on main canal, turns on meska
7. Conveyance losses (seepage)
8. Small discharges of water
9. Need to lift water
10. Lack of water control in canals, meskas and fields
11. Waste of water from delivery system (no night irrigation)
12. Poor condition and inadequate maintenance of gates, ditches and meskas
13. Inadequate elevation for good gravity irrigation.

B. Salinity and water logging caused by:
   1. Ineffective field drains
   2. Lack of field or tile drains
   3. Too much water flowing in ditches and drains
   4. Poor condition of canals, meskas and control devices such as gates and diversion structures

C. Land out of production (10 to 15% of many areas)
   1. Unnecessary or ineffective field drains
   2. Non-cropping due to lack of water (tail ender problem)
   3. Excessive area occupies by canals, drains, meskas

D. Social-economic cost of lifting water

E. Extension service doesn't provide adequate support

F. Micro-nutrient deficiency

G. Rate and timing of fertilizers

H. Low plant stand density

I. Shortage and cost of labor at critical times

J. Land preparation (seedbed)

K. Poor weed control on-farm and in irrigation ditches

L. Poor insect control

M. Planting dates for some crops (maize and cotton) not optional from climate point of view.

More details on these major problems are given in Volume I, II, III and IV of the Mid-Project Report. Some of the problems and their solution are area specific, such as, excessive canal seepage in the Mansouria area (40 to 50% of the water is lost) which represents the sandier soils along the fringe between the Nile alluvial valley and the desert, the numerous inadequate surface drains at Kafr El Sheikh, the inadequate elevations of the water in the canal and meskas at El Minya which causes the farmer to take too long to irrigate (poor gravity irrigation system), or the use of mechanical rice planting at Kafr El Sheikh which improved yields by 24% while reducing water consumption by twelve percent. Other problems are general such as unlevel fields, poor conditions of meskas and lack of knowledge by farmers and government officials. Even though some of the problems are general to the three areas, solutions may be area specific; some examples are lined or buried pipe delivery system at Mansouria, improved soil canal and meskas at

El Minya and farmers' willingness to cooperate while cleaning and shaping meska's at Kafr El Sheikh.

In all areas farmer organization, irrigation advisory service and irrigation system operation improvement are necessary condition for any lasting cost effective irrigation improvement.

Remaining Work:

To reach the end of the project status with results that will satisfy project objectives require the following:

A. Successfully carried out pilot projects in the three areas that test for economic justification, farmer and GOE acceptability. These pilot projects will test on-farm irrigation practices, and delivery system improvement farmer organization and irrigation advisory service. See Table 1 for construction summary of these interventions.

B. Complete the following specific tasks:

1. On-Farm Irrigation report or reports with recommendations.
2. Water Distribution Systems report or reports with recommendations.
3. Farmer organization report or reports and recommendations.
4. Irrigation Advisory Service, Farm Management and Planning report or reports with recommendations.
5. Water Budget report for each area.
6. Land Leveling reports with recommendations.

TABLE 1

Construction Summary of Pilot Project Irrigation Interventions

| Item | Design Completion Date | Begin Const. Date | End Const. Date | Cost in U.S. Dollars | |
|---|---|---|---|---|---|
| | | | | U.S. | GOE |
| **Minya** | | | | | |
| 1. Meska #26. Raise 800 meter meska to irrigate by gravity, install headgate, pump station, 3 check-structures and bridges, and 20 vents. | 12/15/80 | 1/1/81 | 1/26/81 | -- | $10,000 |
| 2. Abucha Canal. Raise 4,080 meter canal to serve 30 meskas for gravity irrigation. Install headgates, checkstructures, bridges. | 7/1/81 | 10/1/81 | 1/31/82 | $10,000 | 80,000 |
| **Mansouria** | | | | | |
| 3. Meska #10. Raise and line with concrete a meska which serves 57 feddans. Install pump, gates, bridges and tail escape. | 4/1/81 | 4/15/81 | 7/1/81 | 1,000 | 10,000 |
| 4. El Hammami pipeline. Construct buried pipeline to replace the present canal and branch canal to serve an area of 800 feddans. Install two pumps, 62 alfafa valves necessary control equipment. | 12/1/80 | 5/1/81 | 4/1/82 | 200,000 | 350,000 |
| **Kafr El Sheikh** | | | | | |
| 5. No major construction in work plan. | | | | | |
| 6. Misc. construction in these areas are gates, improve meskas, eliminate drains. | | | | 20,000 | 100,000 |
| TOTAL | | | | 231,000 | 550,000 |

7. Soil Fertility reports with recommendations.
8. Soil Characterization reports with recommendations.
9. Pest and Disease Control reports with recommendations.
10. Conjunctive Use report with recommendations.

C. Provide participant training to complete the task of increasing institutional capabilities to conduct on-farm water management, irrigation technology and delivery system research. Increase the MOI Irrigation Directorate personnel (District Engineer, Governorate Irrigation Inspectors, Maintenance Personnel, etc.) capability to operate the delivery system in an equatable and efficient manner to obtain and sustain any on-farm water management improvements.

Project staff spent considerable effort in developing a work plan for the remainder of the project. This work plan, which is summarized in the matrix on page 13, has been reviewed by USAID, Project Staff and CID. We believe the work plan is reasonable and can be accomplished provided certain deadlines are met, i.e. construction of the El Hammami pipeline by September 30, 1981 and raising of Abueha Canal by January 1, 1982.

Many of the specific tasks are almost complete, these are the soil fertility, soil characterization and pest and disease control reports. The data have been gathered, analyzed and draft reports completed. It's a matter of finalizing them. When requested by MOI, campus backstopping

and TDY help will be used as needed to complete these reports. This will release project personnel for doing the pilot projects.

Much work has been done on the water budget. With the addition of a full time American (Jan., 1981), appointment of full time Egyptian engineers and continued use of TDY, ground, surface and drainage water experts, analysis of the water budget in the three areas will be completed by June, 1983.

Conjunctive use, although given high priority by reviewers, does not appear to the GOE as a high priority at this time. If time and resources permit, a paper on the state-of-the-art of conjunctive use as it relates to Egyptian conditions, will be prepared.

High priority is given to on-farm irrigation; water distribution system; farmer organization; irrigation advisory service, farm management and planning and land leveling tasks. Much data have been collected and research done on these. Much more will be done in the pilot programs. These tasks will provide answers to specific problems identified by the project and cover the recommendations of the reviewers.

Training has three elements - the Salt River Project exchange, on-farm water management short courses and formal academic training. The estimated number of persons and man-months are in following table and they are described in the following paragraphs.

Table 2
Participant Training
Estimated Number of Persons and Person Months (PM)

| | 1981 | | 1982 | | 1983 1/ | |
|---|---|---|---|---|---|---|
| | Persons | PM | Persons | PM | Persons | PM |
| On-farm Water Management Short Courses in Egypt | 24 | 36 | 24 | 36 | 24 | 36 |
| Training visits to U.S. | 24 2/ | 16 | 24 2/ | 16 | 24 2/ | 16 |
| Training visits to other countries | 9 | 6 | 6 | 4 | 6 | 4 |
| Salt River Project exchange training | 4 | 8 | 8 | 16 | 12 | 24 |
| Academic Training 3/ | 4 | 36 | 8 | 72 | 12 | 84 |
| TOTAL | 41 | 98 | 46 | 144 | 54 | 164 |

1/ Includes training during period of June to December, 1983.
2/ These are the same people taking on-farm Water Management short courses, above.
3/ One person per discipline for an academic year, this will be doubled during project amendment period.

Participant training activities will be increased by utilizing the offer of the Salt River Project (SRP) to exchange staff so that their people will provide on-the-job advice in Egypt and Egyptians will obtain on-the-job training in Arizona regarding on water scheduling, farmer advisory service, system operation, on-farm water management, gate keeping, etc. The on-farm water management interdisciplinary short course that was developed at CSU and transferred to Egypt last summer will be given each summer. Project staff, MOI District Engineers and Research Center Staffs (MOI and MOA) will be the primary users of the course but other MOA staff, Egyptians from other AID projects and GOE University people with water management programs can take the course on a space available basis. Approximately 28 persons can take the course.

As part of the course, a tour to observe irrigation practices in the United States or other countries is planned.

The need for additional formal training of project personnel in each discipline, particularly engineering has resulted in an increase in academic training of project personnel. Eight Egyptian professionals have received nine months of academic and practical training at Colorado State University, (CSU) during 1979-80 and 1980-81 academic years. While at CSU they enrolled in graduate level courses related to EWUP objectives. In addition they were provided with field experience and visits to research stations relevant to their academic objectives

In most cases the trainees were already candidates for advanced degrees in Egyptian universities before they went to CSU. They contacted Egyptian professors before going to CSU to discuss courses which could be used in their Egyptian graduate program as well as meeting the EWUP related requirements. Consequently their training contributed to both EWUP and their own personal degree-oriented objectives.

The trainees selected for these longer term educational experiences have given outstanding performance upon returning to EWUP. This training activity has been expanded to eight persons per year during academic year 1982-83 and summer-fall semesters of 1983.

Purpose Statement:

The original project purpose statement read:

Develop and demonstrate replicable improved irrigation water management and associated practices that increase agricultural production (underlining provided).

The underlined phrase and associated practices, has led to some confusion regarding the work of the project. The intent was not that the project would develop agronomic technologies, nor has it been done, but rather to determine how irrigation practices affect crop production and the effectiveness of certain agronomic and associated practices.

To sharpen the project focus the following new project purpose statement is proposed:

1. Research, develop and demonstrate replicable water management practices (including structural and managerial aspects of the irrigation system, as related to irrigation water delivery, water use, and water removal, and involve the interaction of social, economic, agronomic and engineering disciplines) which will (a) increase the efficiency of the irrigation system and; (b) increase agricultural growth (through yield increases, costs or input reductions and income increases, monitary or in-kind).

2. Increase institutional capacity to develop and sustain an improved on-farm water management program.

End Users:

While farmers will be the primary beneficiaries of information derived from the project they are not organized or responsible for delivery system improvements or for providing an irrigation information service to themselves about new on-farm irrigation techniques. Clearly intermediates will be required to transform project findings into action programs. The overall environment for such utilization of information is better now than when the original project was approved. The economy has more resources to devote to development programs, the planning aparatus is improved through the Master Water Plan and a newly formed Project Preparation Unit, there is a growing concern for the need to conserve water and finally, and most importantly, rising labor costs and value of time to farmers for activities other than just irrigation and inducing farmers to seek greater irrigation efficiencies. These factors are necessary but clearly insufficient of themselves to transmit knowledge to programs. In the latter years of the project the GCE/US teams will need to develop conduits of information and access to the investment decision makers. To date this has not been an overriding requirement but it will be as information becomes more definite.

The Irrigation Directorate has been identified as the primary recipient of research/demonstration findings but a broader constituency should be reached by seminars, workshops and field days.

The problem of lack of distribution of project findings identified by the review team is being corrected. EWUP now has 67 staff papers and 7 project technical papers. The staff papers are designed primarily for in-house review and carry the notation "not for quotation." The project technical papers are available for general distribution.

In addition to internal distribution, staff papers are sent to USAID project officer, campus coordinator, EWUP advisory committee members and the campus planning and coordinating committee.

Project technical papers are to be distributed outside the project to Egyptian Ministers of Irrigation, Agriculture and Land Reclamation. They will also be distributed to agricultural extension, all university and public libraries and research centers at the Ministry of Irrigation and the Ministry of Agriculture.

The 67 staff papers have been reviewed by the campus coordinator and assigned priorities for publication as project technical papers. EWUP has received USAID approval to hire a technical editor to assist with publication and distribution of project technical papers. Project directors are interviewing candidates to fill this position. It is planned to have a minimum of 20 project technical papers published and distributed by the end of calendar year 1981.

Project Replication

The "project purpose" in the original PP and in this Amendment both emphasize development and demonstration of replicable water management practices. To this end recommendations are being developed and people are being trained in MOI and MOA. Task groups within EWUP are working on models of farmer irrigation associations and advisory service systems to improve agricultural growth and water management efficiency.

The specific model to be adopted is a choice to be made by the GOE. EWUP will demonstrate models that have a high probability of success. It will also have a nucleus of highly trained professionals from relevant disciplines available for extending the models. The leadership for extending these research-extension models depends on the desires of the GOE. Several choices are apparent:

1. Continue joint MOI-MOA projects according to the EWUP structure.
2. Organize a MOI advisory service with full authority to pursue irrigation and agricultural related objectives.
3. Integrate the model into the Agricultural Extension Service.
4. Establish an autonomous organization with appropriate linkages to the Ministries of Agriculture, Irrigation and Land Reclamation.

During the period of phase out AID will consider becoming further involved in water use and management activities with the Ministries of Irrigation and Agriculture.

EWUP results will also be used in another USAID project with the MOI. The Irrigation Management Systems project will utilize knowledge gained in EWUP as a basic input in developing the feasibility study and preliminary plan for raising farmer production and productivity in the North Zifta Irrigation District.

Incentive Pay

Civil Servants of the GOE receive salaries below those paid outside civil service. To recruit and retain highly qualified staff incentive payments have been approved for specific organizations in the GOE. Such a system is essential for the most effective operation of this project. The MOI has developed an incentive plan for the project which utilizes funds from a special account under the control of the Ministry of Economy (MOE). Both MOE and USAID have approved this plan and its implementation awaits action by the Ministry of Finance.

V. Rationale for the Project Supplement:

See external evaluation findings (Annex 1) for views that the original and substantive rationale for the project remains valid. However, progress to date, and costs of doing business, indicate that additional time and money are needed to complete the project successfully. The original project paper was based upon the findings of a technical design team which said, in effect, that there are a number of opportunities to improve the efficiencies of the irrigation system and on-farm water management which in turn would improve agricultural

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were also additional items "uncovered" during project implementation. In fact a total program of the sort envisioned in the Project Paper (PP) which required extra effort, is more realistically a 8-10 year project.

A. Research Design Methodology:

The project deliberately chose to use farmer cooperators in problem identification, field testing of interventions and eventually greater participation in operation of portions of the irrigation system. This design has proven a strong asset of the project but it is more time consuming than anticipated.

B. Training:

Notwithstanding the fact that many Americans and Egyptians have formal academic degree relevant to the project the learning and training aspects of the project have proven to be more time and money consuming than anticipated. The project has determined a need to train personnel beyond just those in the Institute to effectively reach the project objectives. e.g. District Engineering staff, key personnel at the Ministry level. These additional training components have added time dimensions for English training and course development.

The ambitious project design implementation schedule seems to imply the American staff will hit the ground running. This should not be the case, nor was it - yet learning takes time.

C. Marginal Time Costs of Everything:

In addition to the major time and cost overrun factors identified above, it appears that nearly everything takes longer to do than originally anticipated. Among the examples are renting space, clearing commodities, appointing staff, and most importantly making decisions.

With respect to the rationale for additional funding, the additional requirements are primarily a function of the fully staffed time extension, commodities and training requirements identified as needed in the work remaining to be done. (See sections immediately above and below for remaining work and financial analysis).

In summary, the rationale for the project supplement stems from the projects relevance to agricultural development, successful progress to date but with major work yet to be done on pilot irrigation interventions and therefore a need for more time and money to realize the project's potential contribution to agricultural growth.

VI. Financial Plan:

The financial expenditure schedule for the project is given in Table 3. It is based on going fully staffed until June 30, 1983 with a phase out during the last year with final report preparation, phasing in of any other technical assistance to MOI and removal of contract personnel. It anticipates increasing contract staff from nine to ten to

Table 3. Project Expenditure Schedule

| | Expenditures | | | Estimated | | Planned | |
|---|---|---|---|---|---|---|---|
| Year 1/ | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 |
| U.S. Dollars | 1,210,724 | 1,413,235 | 1,768,704 | 1,932,400 | 2,051,400 | 1,990,000 | 871,000 |
| Egyptian Pounds as Dollars | 165,049 | 383,066 | 589,939 | 610,900 | 630,000 | 640,000 | 270,000 |
| Yearly Total | 1,375,773 | 1,796,301 | 2,358,643 | 2,543,300 | 2,681,400 | 2,630,000 | 1,141,000 |
| Cumulative Total | | 3,172,074 | 5,530,717 | 8,074,017 | 10,755,417 | 13,385,417 | 14,526,417 |
| Contingency and Inflation | | | | | | | 702,583 |
| TOTAL | | | | | | | 15,229,000 |

1/ All annual costs are through June 30 of particular year.

provide for an administrative assistant to the project director and retaining the same level of backstopping and TDY as in the past. Actual use of TDY will be limited to that necessary as requested by MOI. The associated costs of these were projected from cost experience in the first four years. The increase in expenditures in 1982 and 1983 are to provide additional money for equipment, participant training, pay the costs of the Administrative Assistant and water budget engineer. The break down of the budget is given in Table 4.

The equipment budget for 1981 and 1982 contains money for gates, pumps and control systems for support to the pilot project construction activities estimated at $231,000, laser plane land leveling equipment at $80,000, canal cleaning ditcher with tractor at $10,000 and replacement of some vehicles, air conditioners and office, laboratory field equipment. Estimated pilot project construction costs are given in Table 1. The equipment budget in 1983 is for replacement vehicles, equipment and spare parts.

The increased participant training budget being sought in this project supplement is to provide an estimated 406 PM of training to 141 persons. The cost of the on-farm water management short course provides for expatriate TDY help estimated at 5 persons (10 PM) a year in 1981, 3 persons (6 PM) in 1982 and 2 persons (4 PM) in 1983. The major instruction effort will be provided by Egyptian staff. Also included in the cost of the short course are training visits to the U.S. or other countries. The costs are for travel and per diem. In the U.S. the tour

Table 4 Egypt Water Use and Management Project Budget

| Line Items / Period 3/ | Original Budget 1977-1982 | For Original Project Paper 1/ Actual 1977-1980 | Estimated 1981 | Estimated 1982 | Life of Project 1977 - 1982 | Project Amendment 2/ Amendment 1983 | Amendment 1984 | Total 1983 - 1984 | TOTAL 1977-1984 |
|---|---|---|---|---|---|---|---|---|---|
| **Project Expenditures (U.S. Dollars)** | | | | | | | | | |
| 1. Salaries | | | | | | | | | |
| Field 4/ | 1,351,000 | 602,500 | 357,500 | 455,000 | | 491,000 | 234,000 | | |
| Short-Term | 363,000 | 199,000 | 150,000 | 165,000 | | 170,000 | 40,000 | | |
| Campus | 630,500 | 532,600 | 170,400 | 165,000 | | 160,000 | 90,000 | | |
| Subtotal | 2,344,500 | 1,334,100 | 677,900 | 785,000 | 2,797,000 | 321,000 | 364,000 | 1,185,000 | 3,982,000 |
| 2. Direct Costs | | | | | | | | | |
| Allowances | 725,000 | 223,200 | 162,000 | 198,000 | | 209,000 | 98,000 | | |
| Equipment | 1,040,000 | 973,800 | 340,000 | 150,000 | | 100,000 | -o- | | |
| Per Diem | 75,000 | 23,100 | 5,800 | 6,400 | | 8,000 | 2,000 | | |
| Travel & Transp. | 372,000 | 155,600 | 80,000 | 80,000 | | 50,000 | 90,000 | | |
| Other Direct Costs | 200,000 | 198,300 | 100,700 | 100,000 | | 100,000 | 50,000 | | |
| Insurance | 230,000 | 33,100 | 12,000 | 15,000 | | 15,000 | 8,000 | | |
| Subtotal | 2,642,500 | 1,607,100 | 700,500 | 549,400 | 2,857,000 | 492,000 | 248,000 | 730,000 | 3,587,000 |
| 3. Training | | | | | | | | | |
| Short Course | -- | 357,900 | 193,000 | 210,000 | | 190,000 | 10,000 | | |
| Salt River Project | -- | -o- | 26,000 | 50,000 | | 50,000 | 30,000 | | |
| Academic | -- | 50,000 | 54,000 | 108,000 | | 123,000 | 65,000 | | |
| Subtotal | 530,000 | 407,900 | 273,000 | 368,000 | 1,048,900 | 363,000 | 105,000 | 468,000 | 1,516,900 |
| 4. Indirect Costs | | | | | | | | | |
| On Campus | 889,800 | 613,100 | 6,000 | 6,600 | | 7,000 | 3,800 | | |
| Off Campus | 207,600 | 150,500 | 125,000 | 171,200 | | 173,000 | 82,200 | | |
| G & A | 385,600 | 280,000 | 150,000 | 171,200 | | 144,000 | 68,000 | | |
| Subtotal | 1,483,000 | 1,043,600 | 281,000 | 349,000 | 1,673,600 | 324,000 | 154,000 | 478,000 | 2,151,600 |
| Total Dollar Costs | 7,000,000 | 4,392,700 | 1,932,400 | 2,051,400 | 8,376,500 | 1,990,000 | 871,000 | 2,861,000 | 11,237,500 |
| 5. L.E. Budget | | | | | | | | | |
| Salaries | 123,000 | 69,900 | 36,700 | 37,800 | 1,444,000 | 57,600 | 24,300 | 81,900 | |
| Benefits | 31,300 | 13,200 | 6,100 | 6,300 | 25,600 | 6,400 | 2,700 | 9,100 | |
| Travel & Per Diem | 715,300 | 453,000 | 195,400 | 201,600 | 850,000 | 160,000 | 67,500 | 227,500 | |
| Housing and Utilities | 652,300 | 284,300 | 177,200 | 182,700 | 644,200 | 224,000 | 94,500 | 318,500 | |
| Other Direct Costs | 707,100 | 317,700 | 195,500 | 201,600 | 714,800 | 192,000 | 81,000 | 273,000 | |
| Subtotal | 2,229,000 | 1,138,100 | 610,900 | 630,000 | 2,379,000 | 640,000 | 270,000 | 910,000 | 3,289,000 |
| Total | 9,229,000 | 5,530,800 | 2,543,300 | 2,681,400 | 10,755,500 | 2,630,000 | 1,141,000 | 3,771,000 | 14,526,500 |
| Contingency & Inflation | | | | | | | | | 702,500 |
| GRAND TOTAL | | | | | | | | | 15,229,000 |

1/ For Original Project only.

2/ Project amendment will require purchase of $ 1.6 million dollars worth of Egyptian Pounds.

3/ All costs are through June 30 of particular year.

4/ Provide for additional staff member; 1981 to end of project, either engineer or administrative assistant.

is to selected irrigation areas, USDA research stations and experiment stations in Colorado, Arizona and Southern California such as Greeley and Grand Junction Colo., Salt River Project and Welton-Mohack in Arizona and Imperial Valley in California.

The costs of the SRP exchange pays only the travel and per diem costs of MOI and SRP personnel. SRP and MOI will pay salary and all incidental costs of their personnel.

The academic training pays tuition, travel, per diem, and books of participants. The 1981 costs are based on experience of sending 4 persons for the 1980-81 academic year. The 1982 and 83 costs are for eight persons per academic year adjusted for increases in tuition and per diem. The $65,000 in the last half of 1983 is to provide for 8 person semesters in the fall.

The total cost of participant training in the last 2 1/2 years of the project is $836,000 or almost double that spent during the first four years. This increase recognizes the need to improve the basic skills of the Egyptian staff in economics, sociology, agronomy and engineering as they relate to irrigated agriculture and on-farm water management. The participant training utilizes the opportunity presented by the Salt River Project to train people and provides academic training in basic skills at United States Universities. The short course program now established in Egypt, provides hands-on field training. It is anticipated that the MOI will take over and fund the short course as an

integral part of their training facility. Both Dr. Abu-Zied, Director of the Research Center and Dr. Wahby; Director of the Project have stated that this is the MOI intent.

The additional costs of the water budget engineer and administrative assistant are the dollar costs of salary, allowances, insurance and transportation of household goods and personal automobile. It does not include the L.E. costs of housing, incountry travel, etc. These costs are included in the L.E. budget.

Of the six million dollars to be added to the project, the cost overrun for completion of the original project is estimated to be $ 1,526,500 (1977-1982). The extension of the full project for one year (1982-1983) requires another $ 2,630,000 and the phase out period (1983-1984) needs an additional $ 1,141,000. An amount of 12% of the six million dollars for contingency and inflation was also added. A more complete breakdown of the project budget is shown on Table 4. All costs are through June 30 of the year stated.

Pipeline:

With the current rate of expenditures in both LE and dollars running about $2.5 million, see Table 3, and a current amended PACD date of December 31, 1982 the original project is short funded by about $0.5. Hence, even without project supplement there is a need for additional L.O.P. funding. Project planning, implementation, staffing and programing of current work require an early decision regarding the supplement.

With $7.0 million in the grant agreement at this time and with the current rate of expenditures, the project will have about $0.67 million in the pipeline on June 30, 1981. At the current rate of expenditures the present pipeline will last about 5 months. Thus, a new grant agreement with the GOE and PIO/T are needed by Sept. 1, 1981 to add the additional funds so that project activities will not be interrupted.

The supplement to provide additional funds and to extend the project is needed as soon as possible to maintain project planning, staffing and programming. The supplement could be fully or incrementally funded and could be provided from FY 1981 or from "early" FY 82 funds. Life of project funding is recommended. If overall program pipeline management considerations indicate a need to withhold FY 1981 obligations, at least a FY 1981 project supplement authorization is recommended. Given the current rate of expenditures which are about $2.5 million per year and the need to process the authorization in FY 1981, it is further recommended that funds be provided in FY 1981.

VII. Additional Requirement

A justification and recommendation, by the Director, USAID/Egypt for non-competitive procurement covering negotiation of a contract with the Consortium for International Development and for local cost financing is included as ANNEX III.

VIII. Evaluation Plan:

A. The project shall have annual reviews by the GOE and USAID with respect to project accomplishments.

B. Early in CY 1983 an external review will be organized and carried out with respect to (1) project achievements, (2) lessons learned regarding this type of project and project management in general and (3) recommendations for carrying on substantive research/demonstrations and further institutional development.

C. Internal to the project are the evaluations of the specific irrigation and other insterventions, the research agenda and other items relative to inputs, outputs and end of project status.

IX. Covenants and Conditions Precedent:

Only standard C.P.'s

X. Waivers:

a. Recommendation for Dollar Funding of Local Costs (Annex III)

b. Recommendation for Non-Competitive Procurement (Annex III)

XI. Conclusion:

In view of the above, the USAID/Mission/Cairo concludes that to ensure successful completion of the project, it is in the interest of the United States to provide an additional $ 6.0 million of financing for this project beyond the $7.0 million and L.E. 1.560, authorized to date.

Annex 1. Conclusions and Recommendations of Nov. 1980

Evaluation and Response

## 8. CONCLUSIONS

8.1 Project design is very good and could not be significantly improved with the benefit of hindsight. The three-stage phasing (problem identification/testing of solutions/pilot projects) is logical. The interdisciplinary approach is appropriate. The institutional framework and physical location of office and field sites is optimal. Addition of an expatriate project administrator would have allowed the technical director to focus more on the management function of keeping outputs on course.

8.2 Inputs: Due to startup delays the project will have by June 1982 only 4½ years of effective work time to accomplish a five-year program. Monetary and staff inputs were generally available as planned and did not constitute serious constraints on achieving outputs, although there was an insufficiency of Egyptian civil engineers and an overabundance of short-term consultants. Equipment and instruments procured were sometimes not the most appropriate. Relations between the national and expatriate teams are excellent. There is a high regard in the Egyptian team to the dedication of the contractor team, although there is a feeling that some new advisors are junior in age and experience to those they replaced.

8.3 Project assumptions held true and did not constrain achievement of outputs and purpose. However, unless a solution is found by January 1981 to the problem of incentives, motivation of the Egyptian staff will decrease significantly, with a serious effect on the attainment of project outputs.

8.4 Outputs -- internal objectives: The chief achievements of the project to date has been (a) creation of a well-trained, motivated, truly interdisciplinary Egyptian water use research team which is field-oriented and has an excellent rapport with the farmers, and (b) establishment of the methodology of doing bona fide agro-irrigation research on the farmers' fields and with their cooperation. The evaluation team considers that these institutional achievements far outweigh the shortfalls in meeting external objectives, noted below.

8.5 Outputs -- external objectives:

(a) The problem-identification stage in essentially complete, including soil studies, outlet studies and on-farm surveys. Most (though not all) of the problems identified were known before, but this is the first time that they were quantified. The farm budget studies are the best in Egypt, but they were not constructed with specific uses in mind, which may limit their usefulness for the coming project trials. Altogether, none of the findings of the problem-identification stage was such that the interventions contemplated at present could not have started one or two years ago.

(b) The crop experiments constitute the most notable results of the project to date. Apparently they constitute the only on-farm agronomic research going on in Egypt. Significant yield improvements were found to result from zinc application in most (although not all) cases and from pest control in vegetables. However, most agronomic experiments were divorced from irrigation factors and as such of little relevance to project purpose (although, by serendipity, they might have a greater effect on achievement of project goal of raising small-farmer income). At present agronomic experiments are more closely related to irrigation practices, but not yet completely.

(c) Irrigation trials at field level are on the way in all three sites through the use of precision leveling, large basins and long furrows combined with agronomic improvements. Results are still preliminary.

(d) Delivery water interventions (canal and mes/ah trials) have not yet started; this constitutes the chief shortfall of the implementation and precludes the possibility of the project reaching its most important output targets (pilot-tested replicable technologies for improved irrigation) by June 1981. The evaluation team finds nothing in the results of the problem-identification phase or other factors which would not have allowed canal and mes/ah trials to start one or two years ago, in time to achieve project outputs.

8.6 The next project stage: The upcoming phase cannot be called "pilot programs", since none of the technologies proposed have yet been tested by EWUP and found worthy of wider application. The interventions contemplated consist mostly of mes/ah and canal trials for establishing prototypes of new technologies, such as raised mes/ahs and buried pipelines for gravity irrigation. Naming them "pilot projects" masks the fact that they could and should have started 1 - 2 years ago, and encourages loading them with other interventions (agronomic practices, advisory service) to the extent that by project end it may not be possible to define the benefits of the irrigation technologies per se.

8.7 The project plans assume a six-month project extension, with final reports on the "pilot projects" due by December 1982. In light of project delays to date, it is less than likely that definitive results of the canal trials will be available by that date. The most likely result is that the contractor will fulfill the letter of the contract, but will not satisfy MOI expectations.

8.8 Agronomic interventions were found to have higher payoff and replicability potential and lower initial investments than irrigation interventions. Thus mine application showed yield increases of up to 67% in rice and apparently 100% in wheat; pest control increased vegetable yields by 80% to 1400% in certain trials; use of a rice transplanter increased yields by 24% while reducing costs; and halving fertilizer application in Mansouriyah increased yields

by 10%. Project staff is confident that improved agronomic techniques (better fertilizer and micronutrient application, pest control, cultivation techniques, higher plant densities and improved varieties) can increase national average yields by about 25% without changes in the irrigation system.

8.9 Irrigation interventions may consist of the following, listed roughly in the order of their payoff and replicability potential.

(a) Improved rules have high replicability and offer considerable local water savings (17% in Beni Magdoul), but the effect on yields is unknown and may be negative.

(b) Mechanical cleaning of branch canals and mes/ahs offers high payoff and replicability at relatively low investments.

(c) Improved water-lifting equipment (e.g. low-speed pumps, ball-bearings-mounted sa/ivas, bicycle-driven tambours, farmer-operated diaphragm pumps) have the potential of high payoff (reduction of pumping labor and costs) and replicability. However, prototypes must still be tested.

(d) Conjunctive use of drain and canal water has a good replication potential for water savings.

(e) Supplementary well irrigation has a good potential in light soils, at least for vegetables.

(f) Lining canals and mes/ahs induces local water savings at relatively high investments. Yield increases are probable. Replication potential is low to medium.

(g) Raising canals and mastabas saves pumping costs but incurs relatively high investments. Due to MOI resistance, replicability is limited. Effect on water saving is not known but probably negative.

(h) Buried pipes save land, but effect on energy and water use is not determined. Due to the high investments, complex organization and pipe shortages, replicability is limited.

(i) Precision leveling may bring about savings of water and irrigation labor, and free land occupied by farm ditches. However, due to constraints of the cropping cycle, access roads, skilled personnel, need for organization at farmer and GOE level, and low felt need of the farmers, replicability potential is low.

8.10 The Ministry of Irrigation is the chief interested party in the project. The overriding MOI objective is water saving for horizontal expansion. MOI professes little interest in yield increases in the presently cultivated areas through better water management, and is against reducing farmer labor and costs by eliminating pumping, since it believes this will increase water use.

8.11 MOI expectations from the project are the following, roughly in order of priority:

(a) technology, water use, costs and benefits of buried pipelines;

(b) water savings and benefits of lining;

(c) possibility of doing without covered drains by better field water management;

(d) technology and water savings of improved gates;

(e) other reductions in total water requirements.

8.12 The MOI has considerable anticipations regarding the project, and must have at least preliminary results on the above topics by June 1982.

8.13 Lack of a sufficiently results-oriented attitude on the part of the contractor team is considered the chief reason for project shortfalls to date and limited perspectives for fulfilling MOI expectations by June 1982 or even by December 1982. This is evidenced by the following:

(a) the existing lined canal at Beni Magdoul was not used to determine the benefits of lining;

(b) the existing lift and gravity irrigation in different parts of the Abueha canal command area were not yet utilized to compare the water usage by these two methods;

(c) start on water budgets was delayed 6 - 9 months behind schedule to avoid a possible bias in the on-farm survey;

(d) the farm budget study is not geared to specific uses;

(e) no obvious solutions were tried before the end of the problem identification period, as the PP had recommended;

(f) a local consultant firm was not used to speed design of the Hammami pipeline; and, most seriously,

(g) EWUP choice of technologies to be tested in the coming phase reflects to a large extent an adoption of U.S. technologies (precision leveling, gravity irrigation, irrigation advisory

service) which for various reasons have a low potential in Egypt, rather than either a response to felt MOI information needs (para 8.11) or testing of the technologies which, at least in the view of the evaluation team, are believed to have the highest payoff and replicability potential (para 8.9).

8.14 On the other hand, no serious errors have been committed by the project, and all of the above defects are corrigible. The worst which has happened so far is that the project is about a year late on its planned outputs.

8.15 Dissemination of project results is quite insufficient. The technical papers seem directed at USAID evaluations and the technical articles at international seminars and publications, while the project findings are concentrated mostly in the staff papers, which are meant for internal use only.

8.16 The form of future assistance to water use improvements depends first of all on the scale of the aid envisioned. For continuation of studies and pilot activities, a long-term contract could be either awarded to CID, opened for bids or channeled through the Water Distribution Research Institute. For a major investment in improved water use a project board could be formed, with technical assistance offered by CSU on research aspects and by an implementation-oriented consultant on the large-scale execution aspects; or a single new consultant could handle both aspects.

## 9. RECOMMENDATIONS

9.1 The project should definitely be continued since it is well designed, has had considerable institutional achievements to date, and its implementation problems can be overcome.

9.2 Project purpose should be expanded to include not only yield increases but also labor savings, cost reductions and water savings as means to reach project goal of increased farmer income (water savings imply income of new settlers who would benefit from the water saved).

9.3 USAID should formally establish to the contractor that for purposes of contract fulfillment "on-farm" means not only fields but also those parts of the water delivery and drainage systems which are not regularly maintained by the MOI.

9.4 An optimal action program for the last phase of the project, which would both satisfy MOI information needs and test those irrigation technologies which have the highest potential for payoff and replication, would be:

(a) Mansouriyah:

Primary: i. Study lining of Beni Magdoul canal and mes/ahr to determine water savings and benefits.

ii. Establish, operate and study the El Hammami buried pipe.

Secondary: iii. Study the economy of supplementary well irrigation.

iv. Establish, operate and study elevated mesqahs for gravity irrigation.

(b) Minya:

Primary: i. Establish mechanical cleaning of mesqahs with appropriate equipment.

ii. Establish, operate and study gravity irrigation by raising mesqah 26. Study the irrigation by raised mesqahs at Ibn el Hagar as an existing pilot project.

Secondary: iii. Field-test a slow-speed pump and a ball-bearing-mounted sakiya.

iv. Improve gate on Omm Sen canal, study water savings and effect on yields.

(c) Kafr El Sheikh:

Primary: i. Precision leveling on a large enough area to establish the effects on water balance (including possibilities for eliminating surface or covered drains) and yields.

ii. Conjunctive use of canal and drain water to determine effects on yields, water requirements and soil salinity.

Secondary: iii. Field-test a slow-speed pump and a ball-bearing-mounted sa/ivs.

iv. Improved gate on Om Sen canal, study water savings and effect on yields.

9.5 The above action program represents less effort than the one proposed by EWUT since raising the entire Abucha canal is eliminated and precision leveling is confined to one site. It should be subjected to analysis of staff constraints and reduced if necessary to the "primary" items above only.

9.6 In implementing the action program, personnel and time must be managed carefully. Management must focus on a minimal number of well-defined objectives. Implementation plans must be detailed and clear, and every Egyptian and U.S. staff member assigned specific responsibilities. The advisors should spend at least half of their time in the field, and short-term consultants brought in only if necessary for field jobs. Both successes and failures should be carefully documented as to costs, benefits and necessary institutional effort. Necessary studies should proceed along with the interventions, rather than using the research as a reason to delay the interventions or conducting the research as usual and adding the interventions.

9.7 In order to separate the effects of the (high-payoff) agronomic interventions and the (low-payoff) irrigation interventions, every trial should be carried in four variations: (a) farmer's practices, (b) improved irrigation only, (c) improved agronomy only, (d) both improved irrigation and agronomy. Where resources do not allow this, only improved irrigation practices should be studied, always in comparison with the farmer's practices.

9.8 The following topics should be studied, as a part of the trials program:

(a) water distribution among, and along mas/ahs (the "tailender problem"), water quantity and flow rate to farmer, and irrigation efficiencies;

(b) benefits from increased efficiency of water use;

(c) effect of various water management practices on waterlogging, salinity and alkalinity problems;

(d) predicted upstream and downstream effects of the improved water use practices;

(e) extent to which the farmers are already informally organized for distributing the water among themselves; and

(f) the significance (or lack thereof) of intake rate and advance time in small basins in the heavy Delta soils.

9.9 Farmer organization in the framework of the trials should take place only around a technological innovation (e.g. sharing a pump for an entire mesqah).

9.10 Distribution of project results: The present system of staff papers and technical papers should be changed. Every paper should appear as a draft which would be circulated among the staff for comments. Papers meeting the director's approval would then be revised, edited and broadly distributed: what is not useful to Egyptian irrigation and agricultural planners and scientists should not be worthy of publication. The project should get an editor to assure the English quality of the publications, and compose a mailing list (by name, not position) of all persons in Egypt to whom the results may be useful.

9.11 Short-term consultants should only be called in for functions necessary to accomplishment of the action program defined above and at the initiative of the Egyptian project direction.

9.12 Stateside procurement should be tightened to assure that the equipment and instruments which arrive are the best for the job. Before project end, a standby and a ten-year stock of spare parts should be acquired for each of the measuring instruments.

9.13 The problem of staff incentives should be monitored to assure that a solution is found before damage is caused to project progress.

9.14 Project continuation: A six-month extension could be granted to allow the CID project to complete five years of study as originally planned before proceeding to another long-term contract, or the present project terminated and another long-term contract for assistance to improved water use initiated in June 1982. Which route to take is primarily a matter of administrative feasibility. If the latter option is chosen, final report should be prepared by June 1982 on the work completed by that date. If project continuation is on roughly the same scale as the present project, a team of four experts (engineer, agronomist, economist and sociologist) would be sufficient. These should be senior people with broad theoretical and practical experience who would serve for technically backstopping the Egyptian team, rather than for daily management of field activities. Technical assistance to project continuation should be opened to a bid, which CID can win if its performance between the present time and June 1982 justifies it. If a much larger project including both continuing trials and large-scale irrigation system improvements is contemplated, then the contractor must be a firm dealing in large-scale execution of water projects, with CID conceivably continuing in the research function. To assure the success of the interdisciplinary approach, the new project should specify in detail the activities required of MOI and any other participating agencies, and make these binding conditions.

9.15 Other projects: As agronomic interventions were found to have in general a higher payoff and replicability potential at a lower per feddan cost than irrigation interventions, USAID should direct more resources to assist agronomic interventions such as micro-nutrient application, pest control, improved cultivation practices, fine-tuning fertilizer requirements, increasing plant populations and introducing improved varieties.

Response

The reviewers conclusions and recommendations concerning project design, continuation, expansion of project purpose, need for project extension and need to focus the work plans for the next project phase are concurred with. Contacts with MOI officials and their request for additional time and funds indicate GOE desire to continue the project essentially as designed.

Project staff, American and Egyptian, also agreed with major findings concerning project objectives, extension, need for better definition and focus of the work plans and to place major emphasis on irrigation interventions. However, they disagreed with many of the details of the reviewers report and suggested action program. Project staff, taking into consideration the reviewers recommendations, the ideas and concepts of USAID and MOI officials, through a series of planning meeting develop a detailed work plan for the next two years. This work plan concentrates on irrigation interventions, doesn't attempt to separate the yield response function between agronomic and irrigation changes but utilizes the best agronomic practices to optimize the yields from good water management practices. As will be explained later in this section research the separate between agronomic and irrigation interventions is not appropriate for this project.

In the following paragraphs are specific responses to the evaluation reports conclusions and recommendations.

8.1 Project design. Mission agrees and in the extension has provided funds for an Assistant to the Technical Project Director.

8.2 Inputs. Mission agrees but in their discussions with project staff did not find the same concerns regarding to many short term staff,

inappropriate equipment or age and experience of the expatriate staff. Dr. Abu-Zeid, Director of the MOI Research Center expressed the belief that all but two or three TDYs performed up to expectations, that the new staff were very well qualified and the examples of inappropriate equipment in the review report were misleading. For example, the cement mixers were not to be used with the slip-form ditch paver. Redimix trucks available in Egypt are to be used with it. He also thinks slip-form paving will be useful for Egypt and hopes the project will use the equipment in a demonstration.

8.3 Mission agrees. The MOI has requested use of the special fund for incentives and COE is working to establish a uniform policy on incentives.

8.5--(a) There was no way that the interventions contemplated could have been started one or two years ago. These interventions require a trained Egyptian staff, the cooperation of farmers and an in-depth knowledge of the problems that exist on the farm and in the distribution system. To intervene two years ago to impose an engineering solution to delivery system improvement without consideration of the nature of Egypt's agriculture would have resulted in an immediate confrontation with the farmers in the project areas.

(d) Delivery System Interventions. Delivery system interventions could not be started without a trained Egyptian staff, obtaining farmers cooperation and knowledge of what the intervention should be. It is easy to come in two years after the fact and look at what has been done, at the enthusiasm of the Egyptian personnel, the cooperation that is now being obtained with the farmers and hypothesize that this existed two years ago, and therefore two years ago the project should have started major changes in the delivery system.

8.8 Agronomic interventions. Project staff are confident that without improved on-farm water management, including improvements in the delivery system, the yield increases resulting from improved agronomic practices

will not be sustainable. There are water logging and salinity problems, there is wasting of water, land out of production because of lack of water at the tail end, inefficient irrigation that leaves part of a field over irrigated and other parts under irrigated, and in fact the agronomic yield increases will over time be illusionary without irrigation improvement. The argument of agronomic vs. irrigation interventions indicates a complete misunderstanding of irrigated agriculture and the effect on production of poor on-farm water management.

8.9 Irrigation interventions. The revised work plan developed by project staff took into consideration these conclusions of the reviewers along with the views of MOI and AID officials, and their knowledge gained from three years of working in the field.

8.10 & 8.11 Horizontal vs. vertical expansion. The MOI is interested in both vertical and horizontal expansion of agriculture. However in the past MOI officials gave more emphasis on water savings for horizontal expansion than increased yields. Recent reports written by high MOI officials and mission discussions with them, indicate a definit committment and interest in improved on-farm water management, vertical expansion of production and improved conditions for the farmer. A cabinet decision has been made giving the MOI responsibility for on-farm water management and maintenance of meskas.

Para. 8.13--Lack of a result-oriented attitude. This statement is contrary to AID/Ag/Egypt's observation and the reports received from the MOI and the observations of other donors. The practical results and data that this project has produced has been praised by the World Bank, FAO and other donors such as the German Government. Even the reviewers contradict themselves. In Chapter 3 and 4 the following quotes occur:

"on-farm surveys have been developed and is functioning well.

The data from these surveys are excellent and will be especially valuable not only to future programs in irrigation, but also for any other agricultural development program. Much information regarding the existing farmer practices, his constraints and how he copes with them is revealed in these analysis."
"the success of the project in creating an Egyptian water management study team is impressive. The Egyptian project agronomists, engineers, economists and sociologists have an outstanding grasp of the totality of irrigation water management in all its social, economic, institutional and technical aspects. They are reputed to spend more time in the field with the farmers than any other Egyptian professionals. They are confident in dealing with the farmers and seem to enjoy the exchange. The farmers, in turn, have not been alienated from the project but actively seek the advise of the professionals on specific subjects. Moreover, farmers were observed to actually talk back to professionals on specific subjects, showing the degree of confidence which has been built up."
"acceptance by the Egyptian research community of the idea that bona fide agricultural research can be done on farmer fields and with their cooperation."
"The farm survey mechanism provides excellent feedback on agronomic, social and economic status. These surveys should continue throughout the life of the project." "SP 7 found that rice transplanting by mechanical transplanters improve grain yields by 24 percent while reducing water consumption by 12 percent and variable cost of 14 percent." "SP 34 shows that farmers in Mansouria apply phosphorus and nitrogen feritilizer in greatly varying quantities which usually exceed the recommended doses." "In Minya the project expects a 25 percent yield increase in cotton and beans through higher plant density and correct fertilization."
"SP 18 sites a previous research in which the continuous-flow system causes water savings of about 9 percent. At Beni Magdoul (SP 18) shifting to a rotation system plus lining, gate rehabilitation and operation of gate according to demand caused the water consumed per feddan to be only 54 % of that in the neighboring traditional canal."

With regard to the specific examples:

a. Staff paper 18 analyzed the contribution of the changes that occurred in Beni Magdoul. But, water savings by lining Beni Magdoul Canal cannot be separated from the effect of the other actions that were taken along with lining of the canal. Canal was lowered and an engineer controls the headgate.

b. Existing lift and gravity irrigation in different parts of Abucha Canal in El Minya are under study to compare irrigation by gravity

and lift. The data has been gathered, preliminary analysis made, but the report has not been written. Preliminary evaluation indicate that good gravity is as efficient as lift. Good gravity irrigation results from having a canal with an elevation high enough so farmers can get sufficient water to his land to irrigate it in the same length of time or shorter than it could be done under lift.

c. The contract team states this statement is not true.

d. Contractor stated that farm budget studies are geared for use in the evaluation of any interventions.

e. Several obvious solutions were tried such as the zinc fertilizer trial, corn trials, and long furrow irrigation. However, the major emphasis was on determining the problems.

f. An Egyptian consultant firm does not exist with the capability of designing the El Hammami pipeline.

g. The project chose technologies to be tested based on the results of three years research. Some are an adaptation of U.S. technologies such as precision leveling and gravity irrigation. In the opinion of project staff, with its three years experience, these should produce a high payoff for Egypt. An irrigation advisory service is only now being undertaken in the United States.

This statement does not make sense when one realizes that the state-of-the-art of irrigated agriculture exists in the United States. The United States has the highest yields per acre of any country in the world. The project need not apologize for utilizing in the pilot project methodologies that have been derived and researched in the United States. These same methodologies have been tested in Pakistan, are being tested in

Egyptian experiment stations and are being adopted by other LDCs. Be that as it may, the pilot projects were designed by all the project personnel (Egyptians and Americans) from their knowledge gained from 3 years of working on the project.

8.15 Dissemination of project results. The mission agrees that the dissemination of project results needs improvements. Project staff have agreed to speed up the process of review of staff papers and to disseminate project results more widely.

8.16 The form of future assistance. The mission believes an extension of the present project for one year with a phase out during a following year and the use of the present contractor who is in place is the best way to meet project objectives. Discussions with MOI also support this conclusion.

Chapter 9 - Planning

9.1 Mission agrees.

9.2 Mission agrees.

9.3 Discussions with contract personnel show that they have always considered on-farm included the delivery system. The pilot projects and project work plans all support this interpretation. No action is deemed necessary.

9.4 Optimal action program. Project staff have developed a work plan for the last three years of the project based on this review and discussions with GOE and MOI officials. USAID/Ag/Egypt has taken an active role in the development and believes it will accomplish project objectives, is doable with the increases in funds and time under the conditions that the GOE can construct the El Hammami pipeline and raise Abucha Canal, this

(1981) year. A contract to build El Hamsami pipeline has been let to a private firm at this time.

The action program differs from that of the review team in the following ways.

(a) Mansouria:

1. An update of SP 18 on Beni Magdoul will be completed but the benefits of lining of it cannot be determined because of the interactions of the other two interventions. Lining of meskas will be studied.
2. A general conjuctive use report will be written but a study of the benefits of supplemental well water will not be mad

(b) Minya:

1. Will not study the San El Hagar because of the effort involved.
2. Will raise Abueha Canal to determine cost and benefits of gravity on a branch earth canal.
3. Will not study sakia improvement but will cooperate with other AID project: developing improved farm machinery.
4. If time and resources allow will improve the gate on Abueha Canal. Om Sen Canal is in Kafr El Sheikh.

(c) Kafr El Sheikh:

1. Major program will be on farmer organization to clean and improve meskas, on-farm irrigation and land leveling.
2. Will not study conjunctive use but area will be included in conjunctive use report.
3. A field test of slow speed pump and sakias will not be done except in cooperation with other projects, such as, Rice and Small Scale Agricultural Activities projects.

(d) Land leveling and irrigation methods will be studied in all areas.

9.5 The project action program represents less effort than proposed by the reviewers in that land leveling and raising Abucha Canal is substituted for pump development and a major effort in conjunctive use. The [illegible] interested in a meaningful test of gravity irrigation which can only occur by raising and improving a branch canal.

9.6 Mission agrees and project staff have made their work plans more specific.

9.7 Agronomic vs. irrigation interventions. It was not a project objective to separate yield increases between agronomic changes and water management changes but to determine and demonstrate yield increases resulting from improved water management practices. Nor should it be. This would be water production function research. A recent book "Water Response Functions for Irrigated Agriculture" by Earl O. Heady and Roger Hexem has this to say about the nature of this research.

"Obviously, then, water response functions are complex functions (a) in their dynamic nature (b) in their interactions with other biological inputs such as fertilizers, plant variety, pesticides, etc. and (c) in conformance with their surrounding soil and climatic environment."

"The budget needed for comprehensive accomplishments must stretch far into the millions of dollars. Projects of this financial magnitude are now being financed by the Agency for International Development through Colo. State Univ., Utah State Univ. and other institutions."

This definitive type multiple regression analysis is very time and money consuming and is best done under controlled experiment station conditions. Project design contemplated incorporation of improved agronomic practices to optimize the results of improved water management not separating the

two and is deemed sufficient for making both system improvements and water management changes at this stage of water use in Egypt.

9.8 The topics the reviewers list in this section were in the original work plans and are incorporated in the revised work plans.

9.9 Mission and project staff agree.

9.10 Project staff are working on improving the staff papers. A system of review is being developed and an editor is being sought to improve the quality of the English.

9.11 All short term staff were sent to Egypt at the request and approval of the Egyptian Project Director. Dr. Abu-Zeid and Dr. Wahby believed the use of 54 persons created a reservoir of talent for the Project and Egypt. That having Deans and Dept. heads visit the project shows their interes in the project, helps them select personnel to serve on it and help the evaluate these personnel. They furthermore did not know where the reviewers obtained the information that most of the 54 were not useful.

9.12 Stateside Procurement--the purchase of all equipment was undertaken with a complete open and free discussion between the discipline leaders, project directors and the AID project officer. No equipment was purchased for the project without specific request of the project directors and approval of the AID project officer. A ten year stock of spare parts seem inappropriate.

9.13 Staff incentives--the mission agrees and has worked with the MOI to help them resolve this critical issue.

9.14 Project continuation. USAID/Egypt recommends authorization of increased funding and time extensions of the project. This recommendation stems from the projects relevance to agricultural development, successful progress to date but with major work yet to be done on pilot irrigation intervention and therefore a need for more time and money to

realize the project's potential contribution to agricultural growth. USAID/Egypt also recommends continuation with CID as the present contractor and with the present level of expatriate help expanded to include an administrative assistant and editor. The reviewers recommendations of a lessor project staff appears to conflict with their other recommendations with regard to project design, project purpose and value of the project.

9.15 Other projects. USAID/Egypt agrees and has incorporated this suggestion in the project paper supplement.

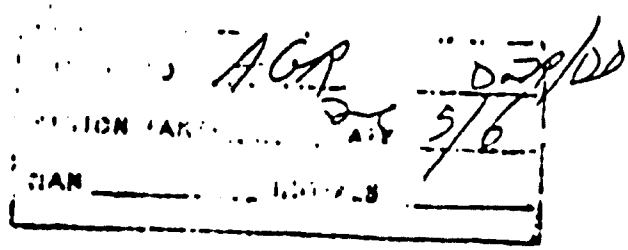
577 MINISTRY OF IRRIGATION
Minister's Office

وزارة الري
مكتب الوزير

ANNEX II

April 2, 1981
Cairo, Egypt

Mr. Donald S. Brown
Agency for International Dev.
American Embassy
Cairo Center Building
Kasr El Aini St., Cairo



Dear Mr. Brown:

The Government of the Arab Republic of Egypt desires to extend the Water Use and Management Project until June 1984 in order to better evaluate the results of the pilot programs in the three research areas. We believe the research and demonstration efforts will prove significant in both water savings and in increasing production of badly needed farm crops to support the goal of increasing food security for the people of Egypt.

We hereby request AID assistance to expand and improve the program of research and extension in on-farm water management. Assistance beyond that provided in the initial grant agreement is needed to finance foreign exchange and local currency costs of the Project. The Government of Egypt will provide additional needed local currency cost as its contribution to the financing of the technical assistance, staff, commodities, construction, training, and other costs of the activity.

We hope that you will act favorably on this request so that we will be able to proceed with the extended project as soon as possible.

Sincerely yours,
M. A. Samaha

Abdel Hady Samaha
Minister of Irrigation
and Sudan Affairs

ANNEX III.

27

## WAIVER JUSTIFICATIONS

a. Recommendation for Dollar Funding of Local Costs

The local currency cost of the proposed project is $8.045 million or 41% of total project cost. Part of this cost, $4.756 million, represents salaries and other in-kind contributions which will be provided by the GOE. The remaining $3.289 million represents support for the TA team and operating expenses to be funded by AID. To require that the GOE pick up these costs, i.e. all costs but the foreign exchange costs, would obligate the GOE to bear 41% of the costs of the project. Given the current tight restrictions expansion of the GOE budget it would be unrealistic to require the GOE to provide such a share of the total project cost. To do so would inevitably introduce delays and would endanger project success. Furthermore, it would greatly reduce the project's net contribution to development capital. The Mission, therefore, proposes to fund $3.289 million of the project's local costs.

$2.229 million (1,560,000 LE of U.S. owned local currency) has already been provided to the project. The supplement seeks an additional $1.060 million (742,000 LE) to be provided from the U.S. contribution to the project.

The source of the new AID-provided local currency will be dollar purchases. At present, the projected availability of excess currency pounds is fully programmed for other activities. Due to the high level of AID activity in Egypt, excess currency cannot cover the needs for project costs and other purposes. If additional excess currency becomes available for this

project, it will be used in preference to dollar-funded purchase. The dollar purchased local currency proposal is in accordance with FAA Section 612(b).

It is therefore, recommended that $1.060 million be allocated for dollar purchase of Egyptian pounds to help meet the local currency costs of the project.

(b) Recommendation for Non-Competitive Procurement

In accordance with procurement regulations APR 7-3.101(B)(5) pertaining to continuation of services under direct AID contracts to complete the original goals and purposes of the project it is recommended that an amendment be negotiated only with the Consortium for International Development for provision of technical services for the final phase of this ongoing project.

The material set forth in the body of this project supplement proposes continuation of the same sets of services contracted for in the present project. The project goals, objectives, and outputs are the same as in the original project paper.

A series of project evaluations which addressed contractor performance as well as project achievements indicate satisfactory delivery of goods and services by the present contractor.

CID and its member institution possess a very wide range of research facilities, in central and branch experiement stations related to water research and application, they have capabilities in academic training and for special short courses - either ongoing or which can be arranged for specific situations. Professional skills are almost always available from member

institutions and in addition CID has excellent working relationships with various private Irrigation Districts and their farmer directors and with State and Federal irrigation agencies.

A close, but purely professional, working relationship has evolved between CID and the Ministry of Irrigation's Water Research Center and the counterpart Institute. There would be no known advantage for the U.S. government to negotiate with another U.S. contractor. In fact, to do so would seriously delay achievement of project objectives.

For the above reasons CID is the logical choice to continue to provide technical services for the Water Use and Management Project, both as it presently exists and as is proposed to be amended.

Egypt : Water Use and Management Project (263-0017)

Certification Pursuant to
AID PR Section 7-3.101-50(B)(5)
Code of Federal Regulations, Volume 41
Chapter 7, Revised as of July 1, 1980

The project paper supplement calls for a continuation of U.S. contractor supplied technical services for achievement of project objectives. I have concluded that the services called for provide for a continuation of activities designed to meet the same purposes originally established in existing contract NE-C-1351.

Therefore, in accordance with the above AID PR citation I certify that procurement of the services called for in the project supplement should be from CID under modification of contract NE-C-1351.

Donald S. Brown
Director

June 1, 1981
Date

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON D.C. 20523

ANNEX IV.

FIRST AMENDMENT

TO

PROJECT AUTHORIZATION

Name of Country: Arab Republic of Egypt

Name of Project: Water Use and Management

Number of Project: 263-0017

1. Pursuant to Section 532 of the Foreign Assistance Act of 1961, as amended (the "Act"), the Water Use and Management Project was approved on June 25, 1976. That authorization as previously amended is hereby amended as follows:

a. The first paragraph is deleted and the following inserted in its place:

"Pursuant to Section 532 of the Foreign Assistance Act of 1961, as amended (the "Act"), I hereby authorize the Water Use and Management Project (the "Project") for the Arab Republic of Egypt ("Cooperating Country") involving planned obligations of not to exceed Thirteen Million United States Dollars ($13,000,000) and One Million Five Hundred Sixty Thousand United States-owned Egyptian Pounds (LE 1,560,000) over a four-year period from the date of authorization subject to the availability of funds in accordance with the AID OYB/allotment process to help in financing foreign exchange and local currency costs for the Project."

b. The second paragraph is hereby deleted in its entirety.

c. A new paragraph is added after the revised first paragraph to read as follows:

"The Project will assist the Cooperating Country to develop and demonstrate replicable, improved irrigation water management and associated practices to increase agriculture production, and to increase institutional capacity to develop and sustain an improved on-farm management program throughout the Nile River Valley and Delta."

2. The Project Agreement amendment, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and delegations of authority, shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

a. Source and Origin of Goods and Services

Goods and services, except for ocean shipping, financed by A.I.D. under the Project shall have their source and origin in the Cooperating Country or in the United States, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Project shall, except as A.I.D. may otherwise agree in writing, be financed on flag vessels of the United States.

3. Based upon the justification set forth in the Project Paper, I hereby determine, in accordance with Section 612(b) of the Act, that the expenditure of United States Dollars for the procurement of goods and services in Egypt is required to fulfill the purposes of this Project; the purposes of this Project cannot be met effectively through the expenditure of U.S.-owned local currencies for such procurement; and the administrative official approving local cost vouchers may use this determination as the basis for the certification required by Section 612(b) of the Act.

4. Except as amended hereby, the Project Authorization, dated June 25, 1976, as amended, shall remain in force.

M. Peter McPherson
Administrator

19. 81
Date

Clearance:
AA/ME:V.Antoinette Ford — Date
GC:John R. Bolton — Date
AA/PPC:Larry Smucker — Date

Annex V

## 5C (2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable generally to projects with FAA funds and project criteria applicable to individual funding sources: Development Assistance (with a subcategory for criteria applicable only to loans); and Economic Support Fund.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

### A. GENERAL CRITERIA FOR PROJECT

1. FY 79 App. Act Unnumbered; FY 80 App. Act Unnumbered; FAA Sec. 634A; Sec. 653(b); (a) Describe how authorizing and appropriations Committees of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that figure)?

a) The proposed project supplement will be the subject of a congressional notification which will precede any authorization.

b) Yes

2. FAA Sec. 611(a) (1). Prior to obligation in excess of $100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

a) Yes

b) Yes

3. FAA Sec. 611(a) (2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

None required

4. FAA Sec. 611(b); FY 79 App. Act Sec. 101; FY 80 App. Act Sec. (501.) If for water or water-related land resource construction, has project met the standards and criteria as per the Principles and Standards for Planning Water and Related Land Resources dated October 25, 1973?

N/A

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| 5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project? | N/A |
| 6. FAA Sec. 209. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. | Not susceptible to such implementation |
| 7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions. | The project will (a) foster farmer water user organizations (b) improve efficiency of water use and (c) increase agricultural output. |
| 8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise). | A large portion of the services and commodities used will be supplied by U.S. private enterprise. |
| 9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services. | The grant agreement will require the Government of Egypt to contribute all additional funds resources necessary to carry out the Project. No U.S. owned fore currencies are presently availab for this project. |

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| 10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release? | All US-owned excess currency is programmed for other purposes. |
| 11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? | Yes. Waiver for negotiation with existing contractor for technical assistance is included in the above PP documentation. |
| 12. FY 79 App. Act, Sec. 608; FY 80 App. Act Sec. (521.) If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity? | N/A |
| B. FUNDING CRITERIA FOR PROJECT | N/A |
| 1. Development Assistance Project Criteria | |
| a. FAA Sec. 102(b); 111; 113; 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts | |

of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

b. FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available: (include only applicable paragraph which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.)

(1) [103] for agriculture, rural development or nutrition; if so (a) extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, full account shall be taken of the needs of small farmers, and extensive use of field testing to adapt basic research to local conditions shall be made; (b) extent to which assistance is used in coordination with programs carried out under Sec. 104 to help improve nutrition of the people of developing countries through encouragement of increased production of crops with greater nutritional value, improvement of planning, research, and education with respect to nutrition, particularly with reference to improvement and expanded use of indigenously produced foodstuffs; and the undertaking of pilot or demonstration programs explicitly addressing the problem of malnutrition of poor and vulnerable people; and (c) extent to which activity increases national food security by improving food policies and management and by strengthening national food reserves, with particular concern for the needs of the poor, through measures encouraging domestic production, building national food

reserves, expanding available storage facilities, reducing post harvest food losses, and improving food distribution.

(2) [104] for population planning under sec. 104(b) or health under sec. 104(c); if so, (a.) extent to which activity emphasizes low-cost, integrated delivery systems for health, nutrition and family planning for the poorest people, with particular attention to the needs of mothers and young children, using paramedical and auxiliary medical personnel, clinics and health posts, commercial distribution systems and other modes of community research.

(3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development; and (b.) extent to which assistance provides advanced education and training of people in developing countries in such disciplines as are required for planning and implementation of public and private development activities.

(4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is: (i) (a) concerned with data collection and analysis, the training of skilled personnel, research on and development of suitable energy sources, and pilot projects to test new methods of energy production; and (b) facilitative of geological and geophysical survey work to locate potential oil, natural gas, and coal reserves and to encourage exploration for potential oil, natural gas, and coal reserves.

(ii) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;

(iii) research into, and evaluation of, economic development processes and techniques;

(iv) reconstruction after natural or manmade disaster;

(v) for special development problems, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;

(vi) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

c. [107] is appropriate effort placed on use of appropriate technology? (relatively smaller, cost-saving, labor using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor.)

d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least developed" country)?

e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"?

f. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's

intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government.

g. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?

2. Development Assistance Project Criteria (Loans Only)

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, at a reasonable rate of interest. N/A

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

3. Project Criteria Solely for Economic Support Fund

a. FAA Sec. 531(a). Will this assistance promote economic or political stability? Yes
To the extent possible, does it reflect the policy directions of section 102? Yes

b. FAA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary activities? No

## 5C(3) - STANDARD ITEM CHECKLIST

Listed below are statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

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| 1. FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed? | Goods and services will be procured to the greatest extent possible through competitive procedures which will encourage participation by U.S. small business. |
| 2. FAA Sec. 604(a). Will all procurement be from the U.S. except as otherwise determined by the President or under delegation from him? | |
| 3. FAA Sec. 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will commodities be insured in the United States against marine risk with a company or companies authorized to do marine insurance business in the U.S. | Egypt does not so discriminat |
| 4. FAA Sec. 604(e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? | N/A |
| 5. FAA Sec. 603 Compliance with requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates. | Yes |
| 6. FAA Sec. 608(a). Will U.S. Government excess personal property be utilized wherever practicable in lieu of the procurement of new items? | Yes |
| 7. FAA Sec. 621. If technical assistance is financed, to the fullest extent practicable will such assistance, goods and professional and other services from private enterprise, be furnished on a | |

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| contract basis? If the facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs? | Yes<br><br>NA |
| 8. International Air Transport. Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will provision be made that U.S.-flag carriers will be utilized to the extent such service is available? | Yes |
| 9. FY 79 App. Act, Sec. 105; FY 80 App. Act Sec. [505.] Does the contract for procurement contain a provision authorizing the termination of such contract for the convenience of the United States? | Contract will contain such a provision. |

B. Construction

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| 1. FAA Sec. 601(d). If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest? | N/A |
| 2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable? | N/A |
| 3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed $100 million? | N/A |

C. Other Restriction

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| 1. FAA Sec. 122(b). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter? | N/A |

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights? — N/A

3. FAA Sec. 620(h). Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries? — Yes

4. FAA Sec. 636(i). Is financing not permitted to be used, without waiver, for purchase, sale, longterm lease, exchange or guaranty of motor vehicles manufactured outside the U.S.? — Yes

5. Will arrangements preclude use of financing:

a. FAA Sec. 104(f). To pay for performance of abortions as a method of family planning or to, motivate or coerce persons to practice abortions; to pay for performance of involuntary sterilization as a method of family planning, or to coerce or provide financial incentive to any person to undergo sterilization? — Yes

b. FAA Sec. 620(g). To compensate owners for expropriated nationalized property? — Yes

c. FAA Sec. 660. To provide training or advice or provide any financial support for police, prisons, or other law enforcement forces, except for narcotics programs? — Yes

d. FAA Sec. 662. For CIA activities? — Yes

e. FY 79 App. Act, Sec. 104; FY 80 App. Act Sec. [504.] To pay pensions, etc., for military personnel? — Yes

f. FY 79 App. Act, Sec. 106; FY 80 App. Act. Sec. [506.] To pay U.N. assessments? — Yes

g. FY 79 App. Act, Sec. 107; FY 80 App. Act. Sec. [507.] To carry out provisions of FAA section 209(d)? (Transfer of FAA funds to multilateral organizations for lending.) Yes

h. FY 79 App. Act, Sec. 112; FY 80 App. Act Sec. [511.] To finance the export of nulcear equipment, fuel, or technology or to train foreign nationals in nuclear fields? Yes

i. FY 79 App. Act, Sec. 601; FY 80 App. Act Sec. [515.] To be used for publicity or propaganda purposes within U.S. not authorized by Congress? Yes