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UNCLASSIFIED

PROJECT PAPER

AMENDMENT

Egypt: Irrigation Management Systems
263-0132

PDAAN862

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete)

Amendment Number: 1

DOCUMENT CODE: 3

COUNTRY/ENTITY: Arab Republic of Egypt

3. PROJECT NUMBER: 263-0132

4. BUREAU/OFFICE: NE 04

5. PROJECT TITLE (maximum 40 characters): Irrigation Management Systems

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 03 DD 18 YY 87

7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4)

A. Initial FY 81 B. Quarter 4 C. Final FY 87

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

A. FUNDING SOURCE	FIRST FY B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total	16,860	21,140	38,000	43,698	95,782	139,480
(Grant)	(16,860)	(21,140)	(38,000)	(43,698)	(95,782)	(139,480)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
Other U.S. 2.						
Host Country		22,600	22,600		247,830	247,830
Other Donor(s)						
TOTALS	16,860	43,740	60,600	43,698	343,612	387,310

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) ESF	133	064		38,000		101,480		139,480	
(2)									
(3)									
(4)									
TOTALS									

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 022, 032, 053, 070, 252

11. SECONDARY PURPOSE CODE

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

A. Code	BS	TNG					
B. Amount	57,040	4,320					

13. PROJECT PURPOSE (maximum 480 characters)

Improve the operating efficinecy of the total irrigation system and strengthen the Ministry of Irrigation's operation maintenance and planning capabilities.

14. SCHEDULED EVALUATIONS

Interim MM 01 YY 85 MM YY Final MM 03 YY 87

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

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a 40 page PP Amendment.)

The purpose remains as originally stated and there are no changes in the amendment not fully consistent with it.

17. APPROVED BY

Signature: M.P.W. Stone

Title: M.P.W. Stone, Director

Date Signed: MM 12 DD 28 YY 83

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM DD YY

UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

CAIRO, EGYPT

December 19, 1983

Action Memorandum for the Director

From: Raymond Fort, AGR/AD Raymond Fort 12/19/83

Thru: Mr. Sweet, DPPE

Subj: Irrigation Management Systems (IMS) Project Amendment (263-0132)

Background: The IMS Project provided that initially the Structure Replacement component should be financed for the first two years of the project only. Supplemental funding for the balance of the work during the remaining three years of the project should be sought under an Amendment, following an appraisal of the work and experience during the initial period.

Discussion: The required appraisal of the Structural Replacement was completed by a team of engineers in June of this year. The findings are positive and, indeed, meet or exceed all expectations. The Ministry of Irrigation, with the assistance of the contractor, has performed well and demonstrated a capacity to complete a national program of rehabilitation of irrigation structures, as envisaged in the original Project Paper.

At the request of the Ministry, we have therefore prepared the attached Project Amendment. This amendment also provides an opportunity to integrate some other relevant irrigation activities consistent with the goals of the IMS Project into the mainstream of the MOI, as discussed in your exchange of letters with Minister Samaha.

Recommendation: That you sign the cover sheet of the Amendment.

Clearance: AGR:JFoster JAF

AGR:FMoore:mf
12/19/83

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V. Draft First Amendment to Project Authorization

VI. Project Checklist Update

I. Summary and Recommendations:

a. Project Title: Irrigation Management Systems (IMS)

b. Project Number: 263-0132

c. Grantee: The Government of Egypt (GOE)

d. Coordinating Agency: The Ministry of Irrigation (MOI), Senior Advisory Committee responsible to H.E. Minister of Irrigation.

e. Implementing Agency: MOI

f. Amount: The original PP projected total AID expenditures for IMS at $112 million of which $93 million were allocated for Structure Replacement (SR). The total amount of $29 million required for project components other than SR was authorized and obligated. In order to gain experience with SR, the Project Paper authorized an initial amount of $23 million only to carry out the SR component for a 2-year period with the expectation that an additional $70 million would be requested upon successful completion of the program during the first 2 years. Of the $23 million, only $19 million was obligated. The project is on schedule and this amount of just over $19 million will have been spent, as planned, on Structure Replacement by the end of the first quarter of FY 1984.

It is planned to obligate now the remaining $4 million originally authorized. On the basis of an Engineering Appraisal Report of June 1983, authorization of an additional $70 million is also requested now for the completion of the remaining 3 years of the total 5-year work program.

The components of the Project other than SR were budgeted and approved for the total 5-year period and will be the subject of a separate mid-term evaluation in the 2nd quarter of FY 1985. In addition, $23 million is now requested to capitalize on the experience gained to-date in the Egyptian Water Use Project (EWUP) by (1) integrating the studies component of that Project into the scope of responsibilities of the Water Research Center and (2) field testing the effectiveness of irrigation improvement at the meska* level to improve the efficiency of water distribution to farmers. The Amendment also provides $4 million for a telemetry system to monitor the entire national irrigation network. The proposed expenditures are in keeping with the project purpose (See k. below). Comparative budgets for the original project and for this Amendment are given in Tables V to VII.

g. Terms: Grant. SR to be funded through dollar purchase of Egyptian pounds. TA funds for dollar costs (about 90%) and local costs (about 10%).

h. Life of Project: Six years total to PACD of July 31, 1987..

i. Total Project Costs: Expected to be U.S. $139.5 million AID and LE 247.8 million equivalent from GOE. This exceeds the original budget by $27.5 million of AID and LE 13.3 million from GOE. The addition provides for integrating activities consistent with the purpose of the project that were initiated or planned separately during the past two years.

j. Goal: As originally stated, effective control of Nile waters for optimal allocation to and within agriculture.

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* The meska is the last link in the irrigation system, the canal that delivers water directly to the fields.

k. Purpose: As originally stated, improve the operating efficiency of the total irrigation system and the planning and management capacity of MOI.

l. Strategy: As outlined in the summary of the PP, the principal thrust of the strategy as it relates to this Amendment is to provide major capital support to reduce and then eliminate the accumulated backlog of SR hampering effective water management and control, while simultaneously the MOI develops its capacity to manage, plan, design, fund, and implement an adequate program to maintain the integrity of the total irrigation system based on the Nile. The first phase of this SR program has been completed by work, as planned, in five irrigation directorates. The present Amendment seeks funds for the implementation of the plan for the second phase of the strategy spelled out in the original PP which calls for the extension of the SR work to the whole country in year 3 of the project.

In addition, this Amendment is designed to integrate the experience gained in other projects which are consistent with the purpose of this project of improving the operating efficiency of the total irrigation system. It is proposed therefore, to continue support of a capacity within the framework of the project to undertake relevant studies along lines pioneered under EWUP which terminates in mid 1984 and to test how best to extend the effective impact of the irrigation system down to and including the meska where the responsibilities of MOI shade into the concerns of the MOA.

Work under the Irrigation Management Systems Project during the initial two years has clearly demonstrated the need for effectively monitoring as a step in improving control of total irrigation flows. The installation of an appropriate telemetry system is, therefore, included as an addition to the IMS Project under this Amendment. These additions

are fully consistent with the purpose of the project to improve the operating efficiency of the total irrigation system.

m. Project Outputs: (a) an accelerated level of SR which will significantly reduce the SR backlog by the end of the project; (b) studies aimed to develop practical irrigation system improvements; (c) field tests of the feasibility of an expanded Regional Irrigation Improvement Project (RIIP) on an area not to exceed 40,000 feddan in two or three representative governorates; (d) a telemetry system to monitor total flows through the irrigation system.

n. USAID Project Amendment Inputs

Summary Cost Estimates and Financial Plan

A. Inputs	AID		
	FX	LC	TOTAL
1. By Type of Expenditure			
Construction	-	60,080	60,080
Contract Services	4,030	590	4,620
Commodities	8,730	980	9,710
Support Costs	4,060	190	4,250
International Conference	-	60	60
Training	2,320	-	2,320
Total	19,140	61,900	81,040
2. By Subactivity			
Structure Replacement	1,410	60,150	61,560
Water Research Center	11,400	970	12,370
Regional Irrigation Improvement	3,000	780	3,780
Telemetry System	3,330	-	3,330
Total	19,140	16,900	81,040
B. Contingency	1,866	184	2,050
C. Inflation	5,832	12,558	18,390
Project Amendment Total	26,838	74,642	101,480

o. GOE Project Amendment Inputs:

	GOE (in LE 000)
A. Inputs	
by type of expenditure	
Construction	84,270
Commodities	6,960
Salaries and Allowances	22,490
Operating Costs	30,360
	144,080
B. Contingency	660
C. Inflation	60,620
Project Amendment Total	205,360

p. GOE Institutions Involved: The primary agency involved is the Ministry of Irrigation (MOI) which has responsibility for all irrigation activities in Egypt. Within the MOI, the Irrigation Department and the field Directorates, the Planning Department including the PPU, the Water Research Center and its Training and Water Master plan units are the major concerned organizations. With respect to RIIP necessary coordination with the Ministry of Agriculture has been assured by decision of the Cabinet.

q. Covenants and Conditions: Remain unchanged, except as noted.

a. The Grantee shall annually review with AID a work plan specifying (1) the areas to be covered by field tests for irrigation; (2) relevant data collection for appraisal and evaluation; and (3) related development-oriented research for the year.

b. The Grantee shall in its annual budget requests include sufficient funds to meet the recurrent expenses of the improved irrigation system.

c. The Grantee shall not disburse any funds under this project for structures related to water lifts over 15 meters without an analysis of the internal rate of return and the specific approval of AID.

d. The Ministry of Irrigation will establish a special separate account in a commercial bank for each of the continuing and new project components. These accounts will constitute the Government of Egypt contribution for running costs and incentive payments. The estimated total requirement for each year will be deposited at the beginning of the year. These accounts will be operated by the respective Project Directors.

Prior to any disbursement, or the issuance of any commitment documents under the proposed Amendment to the project Agreement, except with respect to goods and services to be procured directly by AID, the Cooperating Country shall confirm, except as the parties may otherwise agree in writing, in form and substance satisfactory to AID, the names of the persons authorized to act as the representatives of the Cooperating Country for each of the activities, together with a specimen signature of each person specifically named.

r. Possible Future Amendments:

AID should be prepared to consider an amendment to participate in extending nationwide the experience gained in field tests of irrigation improvement at the meska level.

II. Introduction and Background:

Egypt needs the assurance of a continuing basis for agricultural growth to improve food security and meet the needs of a growing population. Irrigation water must be managed for increasingly efficient use. Otherwise the blessing of a supply excess to needs in this decade could leave a tragic legacy of damaged, waterlogged fields for the coming decades when increasing demand will make water a genuinely scarce resource.

III. Problem Description

The Ministry of Irrigation in Egypt has long been charged with the responsibility for managing the complex system for storage, release, distribution and drainage of Nile River waters which support agriculture and indeed life itself in the country. The basic technology of Egypt's irrigation system and its manner of operation evolved in the historic process of planning and design as greater and greater control permitted a change from traditional basin irrigation to perennial irrigation.

The activities proposed in the original Project Paper (PP) which this document amends represent the results of MOI, World Bank and AID analyses, discussions, meetings and study teams over a 24 month period. Following discussions in the summer/fall of 1979, an Irrigation Rehabilitation/Modernization Team with both World Bank and AID participation was provided. The team identified a number of broad areas requiring assistance 1/ 2/ and was followed in August/September, 1980 by an AID team that examined selected priority areas in more detail. The

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1/ G.L. Corey and E.V. Richardson. Improving Irrigation in Egypt. 2/1/1980.

2/ IBRD, Arab Republic of Egypt - Irrigation Rehabilitation/Modernization, Technical Review Mission Report, February 1980.

work of this "Scope of Work" Team 3/, subsequent discussions with the MOI and a series of meetings with the World Bank Irrigation Sector Team in November, 1980 provided the basis for the Irrigation Management System Project under an Agreement with the Government of Egypt signed on September 22, 1981.

Only a large program of Structural Replacement (SR) which took into account the on-going depreciation while also replacing the backlog of structures was logical. Because of the total amounts involved and the need to gain experience in mobilizing the planning and funding capabilities of the MOI, it was agreed to carry out the SR component of the project in two parts beginning with a work program in 5 selected irrigation directorates funded for an initial 2-year period and to be followed by an expansion of the work to a national scale in 3 subsequent years under the present Amendment.

The completion of the Aswan High Dam in 1964 permitted full control of the flow of the Nile and capacity for multiseason storage. The potential existed to meet the full water requirements throughout the country at all seasons but in many places there developed an excess supply of water relative to aggregate crop demand. This encourages overuse and could lead to water logging and salinization as a result of a rising water table. At the same time in many local command areas, shortages develop due to limited capacity of the canals and the inadequacy of various water control facilities. Either of these conditions, excess or lack of water, reduce the productivity of the land, decrease crop yields, and restrict the range of crops that can be planted.

Quite apart from such short-run supply/demand imbalances there is a long-term need to rationalize the water system. In the long run,

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3/ Stephenson, J.E. et al., Nile River Irrigation System Redesign, Rehabilitation and Improvement Program. Consortium for International Development under AID Contract AID/SDD/PDC-C-0217, W.O. 7, October, 1980.

upstream countries, such as Ethiopia, may divert for their own use tributaries which feed the Nile. It is well to bear in mind that the Nile has no tributaries below Aswan and that there is virtually no rainfall in Egypt. The total water supply available to Egypt is, therefore, limited and must be managed efficiently to serve the competing needs of a rapidly growing population, an expanding industrial sector and the needs of both vertical and to some extent horizontal expansion of agriculture.

Given that long-term agricultural development strategy calls for more high value crops, such as fruits, vegetables and sugar cane, it is likely that, in the foreseeable future, Egypt will have little water margin.

Thus it becomes absolutely critical that Egypt begin to establish the means for a complete and efficient control of the waters of the Nile, in order to achieve maximum benefits from its rich but limited agricultural land base.

IV. Project Description

A. Overview

Summarizing briefly the relevant section of the original PP, the Irrigation Management Systems Project brings together a set of related activities to be carried out within several established organizational units of the MOI and under the management and direction of the respective heads of those departments and sectors. The Ministry has established a Committee responsible for advising the Minister on actions and policies to appropriately integrate the various activities carried out under the Project. The "project" is a related set of Ministry activities to which advisory assistance, financial support and physical inputs are provided by AID. AID inputs become integrated into the Ministry programs through the understandings embodied in an agreement between AID and the MOI which reflects joint commitment to a set of defined objectives. This is the context in which it is understood that action programs proceed.

Beyond the completion of the deferred maintenance, the amendment provides an opportunity to integrate other relevant irrigation activities initiated or stimulated by AID funding into the mainstream of the MOI. This is consistent with the desire of both the Mission and GOE to move from projects towards a sector mode of assistance and allows more effective support of institutions more effectively than discrete projectized interventions. The experience gained in joint USAID/GOE projects over the past few years suggests this course of action. The problem of supplying water to the Egyptian farmer requires a systems approach which includes the meskas as last link in the flow of water from the Nile to the fields where the crops are grown. The IMS frame lends itself to the support of such a system.

As the primary party in this undertaking the MOI, under the Amendment, will provide the major input of financial and in-kind resources, 247.8 million (LE pound equivalent).

B. Framework of the Project

1. Goal

Effective control of Nile water for all uses and particularly their optimal allocation to and within agriculture.

2. Purpose

To improve the operating efficiency of the total irrigation system and strengthen the Ministry of Irrigation's operation, maintenance and planning capabilities.

Operating efficiency means controlling the flow of irrigation water in a way to ensure that water for crop production reaches farmers when it is needed, at the time it is needed and in the amounts required. It means that no water is wasted by unproductive flows from the irrigation into the drainage system, that no excess availability encourages farmers to over-irrigate and thus contributes to deterioration of the land through water logging and salinity associated with rising water tables, and that no fields are short of the water they need.

At the time the original project was prepared, this purpose statement may well have been deliberately broad. It now lends itself, however fortuitously, to the accommodation of a program approach which seeks to strengthen the capability of host country institutions to take much wider responsibility for implementation of grants in support of mutually agreed upon activities addressing clearly defined needs. The additional components of the IMS project supported under this proposed amendment fit readily and logically into the framework of this purpose statement. Studies and the technical staff required to undertake them are needed to maintain a capacity for growth necessary to sustain a steady rate of development. This justifies continued support for strengthening the institutional capacity of the Water Research Center. The results of studies must be validated through realistic field tests. These, with support under this project amendment, may eventually lead to a Regional Irrigation Improvement scheme focussing especially on meskas, the link of the system to the farmer. Lastly, the proposed telemetry system relates directly to the monitoring required for the control mandated by the purpose of the project.

3. Strategy

The project seeks to bring the irrigation system to the point where by 1990, the Structural Replacement (SR) backlog has been eliminated and

replacement is equal to the rate of depreciation. This target date is related to the need to make water increasingly available for on-farm use as demand increases in the next decade with horizontal and vertical expansion of agricultural production. It is likewise intended to eliminate sub-optimal management of the irrigation system as a constraint to agricultural growth by the end of this decade so that a steadily improving set of agricultural support systems can have their full intended effect.

Now that the capacity to proceed on schedule has been demonstrated*, the Project strategy providing for an Amendment at the end of the second year is being implemented through this paper. The project as a whole, by creating an improved supply of water for farmers, directly supports programs being developed for the introduction of improved agricultural production packages through strengthened and integrated Research and Extension services of the Ministry of Agriculture. In order to maintain an overall perspective, and in recognition of the various linkages between components, this amendment presents the complete program for both capital and on-going technical assistance in the financial sections but limits the narrative to the amendment only.

4. Activities:

a. Outputs

1. Assistance to the MOI in undertaking a country-wide program of rehabilitating irrigation structures.

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* Appraisal Report, op. cit.

2. Integration of the EWUP experience into the mainstream of MOI activities of the MOI Water Research Center.

3. Field testing of the requirements and procedures for a national scheme to improve the efficiency of managing irrigation water use at the meska level,

4. Installation of a telemetry system for measuring the flow of irrigation waters and

5. Continuation of the other activities for which funds where obligated under the original Project Agreement for the full LOP.

b. Inputs

Tables V to VII compare the inputs for the original project and those for this Amendment, and show them to be essentially unchanged except with respect to amounts for:

AID

1. Technical assistance advisors and consultants (long and short term).

2. Equipment, supplies, vehicles to support TA activities and meska improvements.

3. Support costs for the exchange program with the Salt River Project, training and some local staff support.

4. Dollar financing of local costs (and possibly off-shore materials) of SR program.

GOE

1. MOI staff time, salaries, per diem and incentive payment.

2. Office space, laboratory and other facilities, furniture, operating costs for vehicles and other local costs.

3. Expanded investment in SR.

4. Access to all available data and information or planning.

C. Detailed Project Description

1. Structure Replacement

The original PP and Project Agreement derived from it provided, within the overall frame work of a 5-year budget, for the initial funding of Structural Replacement (SR) over a 2-year period in five irrigation Directorates. The reason underlying this phasing, although not specifically spelled out in the original documentation, was to test the capability of MOI effectively to mobilize financial and manpower resources required for a national SR program designed to eliminate the accummulated backlog of deferred maintenance and structural replacement by the end of this decade.

By meeting the schedule of implementation the MOI has demonstrated its capacity to manage an SR program. The experience of the first 2 years also validates the cost assumptions of the PP that elimination of the backlog of SR by the end of the decade will require average annual expenditures for this purpose during the decade of about LE 20 million (adjusted for inflation) for construction to the agreed-upon higher specifications and standards.

This Amendment, therefore, provides funds for the remaining three years of the SR budget discussed in the Project Paper by reimbursing the MOI for 80 percent of their SR expenditure with an annual specified maximum AID expenditure. SR funds are used for local costs. Only if appropriate state-of-the-art equipment is unavailable or materials shortages arise are funds used to finance U.S. imports, these arrangements, AID funding, and other details have been specified in special agreements between AID and the MOI for SR activity and PILs will be reconfirmed as each year's budget is being finalized.

To overcome its limited staff capacity, the MOI has accelerated recruitment, organized staff training, placed qualified personnel in the highest priority assignments, and instituted an incentive pay program. In recognition of the constraints within and to a lesser degree outside the MOI (contractors, etc.), the SR program has been accelerated at a moderate pace covering the five Directorates with the most severe SR problem for the first two years before now being expanded nationwide to 20 Directorates. Special efforts have been made to achieve a high level of quality control and to ensure full compliance with MOI specifications. MOI will also continue to certify that all structures for which they request AID reimbursement have been built to MOI specifications.

2. Water Research Center

The Mission has recognized the importance of relevant studies to the development of the agricultural sector. It proposes, therefore, to phase the study component carried out under terminating project-funded host country contracts into the mainstream of the relevant agricultural ministries. For the same reasons that transitional funding has been provided to the Ministry of Agriculture to absorb and integrate pertinent experience of the Agricultural Development Systems Project, it is now proposed to provide for the transition of relevant EWUP activities into

the permanent structure of the Water Research Center of the MOI. The Mission and MOI share the view that the IMS Project Amendment is a suitable vehicle for the transition.

There is, as yet, no definitive evaluation of EWUP, which terminates at the end of June 1984. The Project was scheduled for evaluation in the third quarter of FY 83. This was postponed for one year, so that the evaluation would coincide with the revised project completion and thus allow the total time alloted for the achievement of project objectives. This course of action was overtaken by events, i.e., the development of the IMS Project Amendment which, in the view of both USAID and MOI provides a suitable vehicle for the transition of selected EWUP activities into the mainstream of the MOI.

This transition involves principally a continuation of the technical assistance required to institutionalize MOI research capacity and a practical program of bridging the gap between formal research and major national programs of irrigation system improvement and renovation. In this connection, it is proposed to continue the exchange training program between MOI and the Salt River Project and to support a broad program of field testing of some of the earlier experimental work.

Even in the absence of a formal recent evaluation, however, a number of successes of the EWUP experience can be documented, giving one confidence that some of the insights gained in that Project can usefully be incorporated into the institutional fabric of the MOI's future work on renovation of Meskas, reorganization of maintenance responsibilities, and improved on-farm water use. Moreover, as indicated below, two of the principal criticisms of the 1980 evaluation appear to have been dealt with adequately.

1. An evaluation carried in 1980 faulted the Project for its failure to adopt a results-oriented attitude and to focus on producing the information needed to make intelligent investments in the Egyptian Irrigation System. Emphasis on research it was felt had diverted the team efforts away from the development of the applied field test "package" that MOI expected to receive.

Since the 1980 evaluation substantial progress has been made. With an increasingly well trained staff, resulting from the Project training program, specific research targets and pilot program objectives have been identified and addressed. Interdisciplinary teams and task groups, under appointed leaders, implement work plans designed to achieve specific MOI development objectives. The results are presently being written into final reports and have been incorporated into the MOI's plans for a national irrigation improvement program. A list of pending reports, as well as of selected completed technical Reports and Manuals is given in Appendix I. The technical reports are being widely circulated as shown in the following distribution list. They illustrate the type of development oriented enquiries which we now seek to institutionalize in the Water Research Center by providing the further technical assistance and training which MOI has requested for fully developing the capacity of the Center.

It is evident that the joint Egyptian/U.S. Project team has served an important role in strengthening research and planning capacities of the MOI, but further training of Egyptian staff and ongoing technical support will be necessary in order to develop the research activities and integrate them into the MOI's project planning process activities. This could not be accomplished in the time frame of the project, because of the need to test the process thoroughly before considering its integration into the ministry. Within the project frame useful studies have been undertaken illustrating the need for an ongoing development-oriented capacity to plan and implement practical applied research. Special emphasis in this research process must continue to be placed on economic feasibility and social impact of practical farm-level interventions.

2. In response to criticism in the evaluation about an overly academic orientation Project research has subsequently been done with farmers, under field conditions. Irrigation trials have taken place on farmers'

fields with their full cooperation. Land shaping has been done during the limited time between harvesting one crop and planting the next crop when land is fallow and dry. Farmers have been taught to keep farm business records which have yielded valuable data for economic and farming systems analyses. Water use related agronomic trials on fertility, seed varieties, weed and pest management and planting methods have been conducted with farmers in their fields; and farmers have organized for scheduling water delivery and for meska maintenance.

All of these activities have been integrated into the MOI's five-year plan for irrigation improvement. This shows that the work of the EWUP has been both practical and acceptable to the MOI. If the work in 1980 appeared overly academic to the reviewers, it was partly because strong emphasis was placed on problem identification and field plot work was conducted according to models used by experiment stations. As acknowledged in the evaluation, this emphasis on problem identification helped to avoid premature implementation of "solutions" to imaginary problems.

Subsequently, Experiment station methods of plot work have been de-emphasized, as the staff of former experiment station workers have been retrained and have developed more practical models for on-farm research. On-farm irrigation research and practical investigations have been assigned high priority by the MOI.

The MOI's strategy for extending the lessons learned in EWUP is spelled out in its five-year plan for national irrigation improvement. A recent GOE cabinet decree requires the MOA to conduct a matching program of agricultural practices in areas selected for irrigation improvement. Coordinated implementation of the irrigation and agricultural improvement programs will ensure utilization of the research findings to promote increased farm productivity. This coordination between the MOI and MOA is essential to the full realization of Egypts agricultural potential.

Distribution List for Project Technical Reports

	No. of Copies
1. Ministry of Irrigation	
- Office of the Minister	5
- Irrigation Research Center	25
- Office of the Senior Under-Secretary of State and Chief of Irrigation Dept.	50
2. Ministry of Agriculture	
- Office of the Minister	5
- Agricultural Research Center	25
- Agricultural Extension Department	2
3. Ministry of Land Reclamation	
- Office of the Minister	5

4. Universities

(Publications sent to Colleges of Engineering and Agriculture, depending on the content)

- Al Azhar University
- Alexandria University
- Assyut University
- Ain Shams University
- Cairo University
- El Canal University (Ismailiya)

- El Fayum, Faculty of Agriculture
- Helwan University
- El-Menufeya University
- El-Minya University
- Tanta University
- Zagazig University
- American University of Cairo

-- To each Dean of the College, 5 copies
-- To each University Library, 2 copies.

5. Egyptian Documentation and Information Center for Agriculture (EDICA)	2
6. AID Agricultural Projects (11) one each	11
7. USAID Library	1
8. EWUP Library	3
9. Engineering Research Center, CSU	6
10. Consortium for International Development	1
11. UN Development Program	1
12. National Academy for Scientific Research and Technology (Kasr El Ainy)	3
13. National Research Center (Dokki)	3
14. FAO rome	3
15. For distribution upon request: Cairo,22 Sh., Galaa, Bulaq	100
Ft. Collins, Colorado, USA	100

The ongoing TA and related research training constitute the principal EWUP components carried forward under the umbrella of the IMS Amendment. The justification for this approach is derived from the demonstrable success of the Project, as refined on the basis of recommendations of the 1980 evaluation.

The budget proposed in this amendment includes sufficient funds for equipment considering that equipment of the Egyptian Agricultural Mechanization Project will be made available to support the regional irrigation improvement work as required under the recent cabinet decree requiring MOI/MOA coordination. The equipment needs for the Water Research Center and for the field task of the RIIP are separately shown in Tables III.2 and 3.

On a decreasing scale over the 3 years remaining in the Project, funds will, therefore, be provided under this Amendment to provide for the orderly transfer of responsibility for activities carried out under EWUP to the regular budget of the Water Research Center. These funds will be used to (1) provide technical advice and assistance; (2) assist implementation teams to develop workplans; (3) continue the development and evaluation of pilot programs started under EWUP; (4) conduct research aimed at improving methods and techniques of watercourse network improvement; (5) design, monitor, and evaluate field tests of irrigation improvements at the meska level; (6) develop modern computer assisted procedures for designing improved watercourse networks; and (7) support training in irrigation improvement and professional exchanges for the technical staff of the MOI, including the valuable staff exchanges with the Salt River Project.

3. Regional Irrigation Improvement

Growing out of the EWUP experience and facilitated by the rehabilitation of the irrigation infrastructure undertaken in the IMS project is the possibility of testing the prospects of a national scheme for improving the efficiency of managing irrigation water use by:

(1) Minimizing seepage losses;

(2) Reducing water table level and the pressure on drainage networks;

(3) Controlling water distribution from barrages to the meska outlets; and

(4) Improving water availability at the tail ends of canals and meskas.

The EWUP Project, which terminates at the end of the current EFY on June 30, has tested on an experimental basis various methods for water course improvement to permit more efficient control of water especially at the meska level and thus more effective on-farm water management. The MOI believes that the time has come to apply the findings on a wider and eventually on a national scale.

To bridge the gap between research and a major national program of investment in system renovation, MOI seeks USAID technical assistance and training support for a broad program of field testing the results of earlier experimentation. Specifically, it is proposed to apply the pilot program findings of EWUP to some 40 to 50,000 feddans during the next three years, building directly on the experience gained at the original sites in Giza, Kafr El-Sheikh and Minya governorates. This second step in the improvement of the irrigation system is fully compatible with the

ongoing activities of the IMS project. It is consistent with the overall purpose and goal of the IMS and is responsive to the joint GOE/USAID preference of moving away from a narrowly focused project-approach towards integrated sectoral programs allowing greater flexibility to the implementing ministries. It is, therefore, included in this Amendment.

4. Telemetry System

Currently the water releases on the Nile River are made by the MOI in Cairo based on theoretical water needs and past experience. As the irrigation season progresses adjustments are made based upon complaints and/or request for additional water.

With the current system it sometimes requires several days to transmit information and data to a central location. Consequently, decisions to adjust flows are not always made in a timely manner. Water shortages and water oversupply can occur simultaneously resulting in reduced crop yields and waste of water. There is a continuous demand for adjustment in the flow or water level within the total distribution system.

The proposed telemetry system will collect data for instant transmision to a Control Center, where management decisions are made and implemented. Reliable and timely data will permit timely decisions resulting in refinement of the management and control of the Nile System. In addition to eliminating water shortages and oversupply, the system will help control water logging of soils and increasing salinity levels associated with rising water tables.

This system is a data gathering, storing and transmitting system which will complement the operational Distribution Computer Model in improving operation of the Nile water delivery system in Egypt. This computer

model will calculate water levels both upstream and down stream at the major control and diversion structures. While technologically this is a highly sophisticated system, the actual operation is neither complicated nor costly, so that it is well within the range of current MOI capabilities.

This system is capable of furnishing hour by hour data that will permit determination of short-term operating strategies and thus lead to more effective control of the irrigation flows. As adjustments are required daily in delivery patterns to compensate for changes in demand, the system will be able to check that these adjustments are in fact made. The data will also have historical value and can, therefore, be used in developing long-range operating strategies, comparative analysis of irrigation system performance, and increasing the system operating effectiveness.

5. Evaluation

The Project Paper stipulates that the results of an evaluation at the end of the second year will be a major determinant in the decision to seek additional funding for the SR program. Such an evaluation has been made by a competent team of engineers and their report "Appraisal of the Structural Replacement (SR) Project" is appended to this Amendment*. It provides encouraging evidence the SR program is on schedule and that:

- The criteria, design and construction procedures specified by the MOI general specifications are adhered to.

- There is a range of quality of concrete from very good to good, within acceptable standards.

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* See Appendix III.

- Improved construction standards, with the advice and guidance of the consultant are being progressively achieved.

- A shortage of skilled labor and the recommendations of the consultant to the SR program are motivating contractors to utilize mechanical mixing of concrete, which will help to improve quality of concrete.

- The aggregate and sand utilized for concrete mix is well proportioned and uniformly acceptable.

-The detailed engineering designs and plans are acceptable. The field engineer and inspector check and certify each structure's completion.

- Channel bank protective stone pitching is uniformly acceptable.

- The contracting procedures followed by the Directorates are adequate and are applied uniformly throughout the five Directorates.

- There are adequate and capable engineering personnel to carry out the SR program in the five Directorates.

- The program of work will be completed in the five Directorates by about December 1983.

- No cash flow problems are experienced by the Directorates. The MOI has budgeted sufficient funds. Contracts are being carried out on schedule.

The report also draws attention to a number of ways in which further improvements can be made.

- Quality control needs further improvement, with advise of the Consultant.

- The concrete specifications need to be enforced and/or altered to provide engineers with the means of getting the contractors to improve appearance of the finished concrete.

- The consultant needs to utilize a portable concrete test hammer on field trips to help spot check the quantity and strength of concrete.

- Economic improvement of designs could be achieved, if improved quality of concrete were assured.

- Record keeping on a monthly basis needs to be maintained in the Directorates office for management control and review of progress of work.

- Contracts for a group of structures in a relatively small area are grouped in some Directorates to improve contract management. This practice needs to be encouraged in all Directorates.

On balance, therefore, the level of performance entitles the MOI to expect the second tranch of funds required to complete the SR program as specified in the original PP and the Mission feels justified in submitting the necessary Amendment requesting these funds. The mid-term evaluation of the other components of this Project has been scheduled for the 2nd quarter of FY 1985. Day-to-day routine monitoring of activities does not suggest any special problems or difficulties in implementation of these components.

V. Project Analysis

A. Administrative Feasibility

With the exception of the change in function of the Coordinating Committee to an advisory role, the description of the structures and roles of the key organizations of MOI remain those described in the PP and the structure of the IMS Project. The organizational structure shown in Chart I as is fully consistent with its original purpose and suggests that capacity for adaptation and growth that is typical of mature organizations.

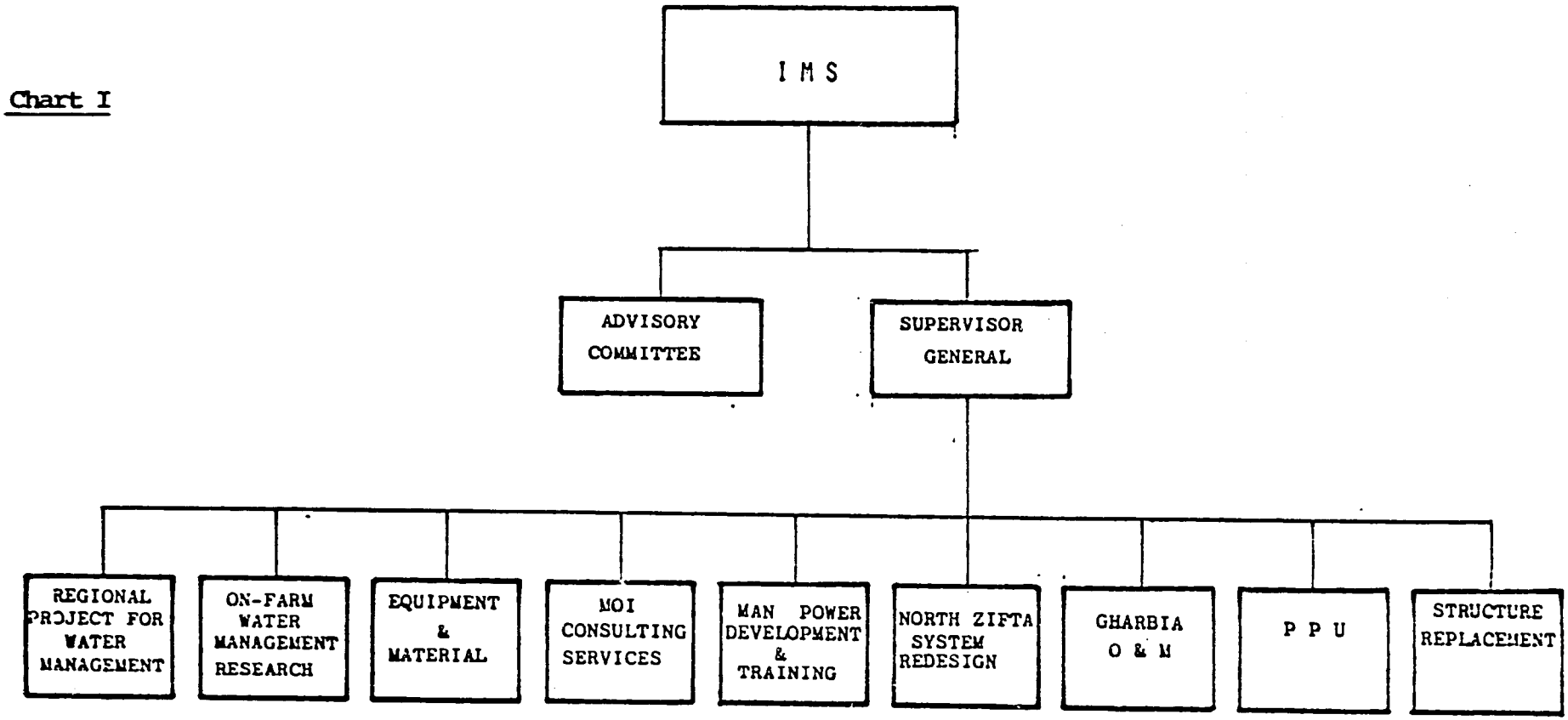
In order to streamline the administrative process so that responsible decision can be made and actions can be initiated more promptly, the day-to-day supervision has been assigned to Activity Directors.

B. Technical Feasibility

As shown in the Appraisal Report and by the EWUP experience to date, the MOI has the capacity effectively to implement this Amendment. The Ministry has demonstrated its ability to make good use of technical and financial resources provided under the grant. There is considerable experience worldwide with telemetry for the monitoring of irrigation systems. Adequate provisions are made in this Amendment for TA and training of Egyptian staff.

Goods and services under this Amendment will be obtained in conformance with AID regulations, according to the guidelines of Handbook 11.

Chart I


I M S
ADVISORY COMMITTEE
SUPERVISOR GENERAL
REGIONAL PROJECT FOR WATER MANAGEMENT
ON-FARM WATER MANAGEMENT RESEARCH
EQUIPMENT & MATERIAL
MOI CONSULTING SERVICES
MAN POWER DEVELOPMENT & TRAINING
NORTH ZIFTA SYSTEM REDESIGN
GHARBIA O & M
P P U
STRUCTURE REPLACEMENT

C. Financial Plan and Analysis

The funding requirements are shown in the following annotated tables. (I through VII)

The principal expenditures are for the extension of the SR component of the project. With very minor adjustments these are essentially as proposed in the initial 5-year program, the first two years of which are now being completed on schedule.

Tables III (pages 2 and 3) summarize the two components of this Amendment. They are compatible with the desirable integration of the study component of that Project into the mainstream of MOI and (2) the development, on a field scale, of the practical experience required for definitive decisions on whether or not to proceed nationally with a Regional Irrigation Improvement Project as tested experimentally in EWUP.

The fourth component of the Amendment (Table III, p.4), a Telemetry Data Collection System for Nile River Irrigation consists mainly of commodity purchases that are budgeted for the first and second year of the Amendment, although actual disbursements will be made only at the rate at wnich equipment is received and/or installed. While some TA and training is required for this component, consideration could be given to obtaining the equipment through CIP.

D. Economic Rationale

For structural replacement, the principal component of the Amendment, the rationale remains that set out in the original Project Paper. In view of the importance attached to an appropriate economic justification for the substantial expenditures under this amendment, the relevant extract from the original PP is given in Appendix II.

Table I

Irrigation Management Systems
Summary Cost Estimates
And
Financial Plan
(in U.S. $000)

Inputs	AID FX	AID LC	AID TOTAL	GOE LC 1/ 5/	PROJECT FX	PROJECT LC	PROJECT TOTAL
Capital Costs							
Structure Replacement		60,080	60,080		-	60,080	60,080
Inflation	-	12,040	12,040		-	12,040	12,040
TOTAL	-	72,120	72,120		-	72,120	72,120
Other Costs							
Contract Services	4030	590	4620		4,030	590	4620
Commodities	8,730	980	9710	8390 3/	8,730	9370	18100
Support Cost	4,060	190	4250	3400 4/	4,060	3590	7650
International Conf.	-	60	60		-	60	60
Training	2320	-	2320		2320	-	2320
TOTAL	19,140	1,820	20,960	11,790	19,140	13,610	32,750
Contingency 4/	1866	184	2050	790	1,866	974	2840
Inflation 4/	5832	518	6,350	2850	5,832	3368	9200
TOTAL	26,838	74,642	101,480	15,430	26,838	90,072	116,910

1/ In addition to this contribution the GOE input will include inputs in kind such as offices, office equipment, libraries, laboratories and other facilities and equipment.

2/ Support cost include salaries and allowances plus operating cost as shown on Table II.

3/ Investments and equipment listed on Table II are shown as commodity line item in this table .

4/ Contingency and inflation allowances were calculated in accordance with recommended AID Guidelines. (Cables - State 234165, dated 8/18/83; State 015265, dated 1/18/83 and memorandum dated 8/9/83.

5/ For convenience, the GOE contribution is shown as a U.S. dollar equivalent converted at 0.83 p.t. = $1.00. The total GOE contribution is fixed at LE 12,806, without regards to any future changes in exchange rates.

Table II

Irrigation Management Systems
Projection of Expenditures
(in US $000)

Inputs	1984	1985	1986	1987	Total
AID					
Capital Costs					
Structure Replacements	5,000	18,360	18,360	18,360	60,080 1/
Inflation	600	3,000	4,000	4,440	12,040
TOTAL	5600	21,360	22,360	22,800	72,120
Other Costs					
Contracts 1/	568	1,519	1578	955	4,620
Commodities 1/	2,800	4,410	2,170	330	9,710
Support Cost	709	1,417	1,417	707	4,250
Training	357	665	664	634	2320
International Conference	60	-	-	-	60
Subtotal	4,494	8,011	5,829	2,626	20,960
Contingency	494	791	528	237	2,050
Inflation	675	1599	1,844	2,232	6,350
TOTAL	11,263	31,761	30,561	27,895	101,480
GOE					
Capital Costs					
Structure Replacement	-	-	-	-	-
Inflation	-	-	-	-	-
TOTAL	-	-	-	-	-
Other Costs					
Salaries and Allowances	227	563	644	596	2030
Operating Cost	58	278	396	638	1370
Investments/equipments	645	2113	2711	2921	8390
Subtotal	930	2954	3,751	4155	11,790
Contingency	91	222	252	225	790
Inflation	144	561	947	1198	2850
Total	1165	3737	4,950	5,578	15,430

1/ $1480 of SR funds listed under contracts and commodities, $980 and $500, respectively. See Table IV.

Irrigation Management Systems
Line Item Breakdown of Cost by Component
Structure Replacement
(in US $000)

PROJECT INPUT	AID				GOE	
	Local Cost	FX	TOTAL		Capital Expenditures	TOTAL
Structure Replacement	60,150	1,410	61,560	1/		

1/ Total includes $1,480 to be used for contracts and commodities, $980+$500, respectively, contingency and inflation purposely not calculated on this table. Under local cost $70 included for contracts (See Table III.)

Table III
Page 2 of 4

Irrigation Management Systems
Line Item Breakdown of Cost by Component
(in U.S. $000)
Water Research Center

PROJECT INPUT	AID Local Cost	AID FX	AID TOTAL	GOE SALARIES	GOE OPERAT. COST & INVEST.	GOE TOTAL
Personnel (Salaries, allowances, etc.)						
Technical Asst.						
Long-term - 6 pos. 3 PY	-	2,160	2,160			
Short-term - 24 PMS/yr.	-	720	720			
Support personnel (Local Hire)	520	-	520			
Subtotal	520	2,880	3,400			
Support Cost						
Travel & Per Diem (in-country & intern)	75	800	875			
Communications & reports	115	100	215			
Misc. Cost	-	678	678			
Home Office backstop	-	2,482	2,482			
Subtotal	190	4,060	4,250	1195	105	1300
Training						
Participant	-	1,432	1,432			
Professional Emp. Exhange program	-	828	828			
Subtotal	-	2,260	2,260			
International conference	60	-	60			
Equipment	200	2,200	2,400	-	3140	3140
Subtotal	970	11,400	12,370	1195	3245	4440
Contingency	93	1,107	1,200	116	314	430
Inflation	367	4,353	4,720	462	1248	1,710
TOTAL	1430	16,860	18,290	1,773	4,807	6,580

Table III

Page 3 of 4

Irrigation Management Systems
Line Item Breakdown of Cost by Component
Regional Irrigation Improvement Project (RIIP)
(in US$000)

PROJECT INPUT	AID			GOE			
	Local Cost	FX	TOTAL	SALARIES	OPERAT. COST	CAP EYP	TOTAL
Project implementation	-	-	-	800	1250	4950	7000
Equipment purchase	780	3000	3780	-	-	-	-
Subtotal	780	3000	3780	800	1250	4950	7000
Contingency	80	310	390	20	130	180	330
Inflation	140	530	670	30	290	720	1,040
Total	1,000	3840	4,840	850	1670	5,850	8,370

Table III

Page 4 of 4

Irrigation Management Systems
Line Breakdown of Cost by Components
Telemetry Data Collection System
(in US$000)

PROJECT INPUTS	AID			GOE			
	LOCAL COST	FX	TOTAL	SALARIES	OPERAT. COST	CAP. EYP	TOTAL
Civil works	-	-	-	35	15	300	350
Telemetry & recording Equipment	-	3,030	3,030	-	-	-	-
Technical Assist. - 2PY	-	240	240	-	-	-	-
Training	-	60	60	-	-	-	-
Subtotal		3330	3,330	35	15	300	350
Contingency	-	310	310	3	1	26	30
Inflation	-	650	650	12	4	84	100
Total	-	4300	4300	50	20	410	480

Table IV

Irrigation Management Systems
AID Project Costs by Component
($000)

Cost Components	Cost Estimates							
	Other Costs					Capital Cost		
	Contracts	Commodities	Support Cost	International Conference	Training	Total	Structure Replacement	Project Total
Structure Replacement								
Local Currency	70					70	60,080	60,150
Foreign Exch.	910	500	-	-	-	1410	-	1,410
Total	980	500	-	-	-	1480	60,080	61,560
Regional Irrigation Imp. Project								
Local Currency	-	780	-	-	-	780	-	780
Foreign Exc,	-	3000	-	-	-	3,000	-	3,000
Total	-	3780	-	-	-	3,780	-	3,780
Water Research Center								
Local Currency	520	200	190	60	-	970	-	970
Foreign Exc.	2880	2,200	4060	-	2260	11,400	-	11,400
Total	3,400	2,400	4,250	60	2260	12,370	-	12,370
Telemetry Data Collection System								
Local Currency	-	-	-	-	-	-	-	-
Foreign Exc.	240	3,030	-	-	60	3330	-	3330
Total	240	3,030	-	-	60	3330	-	3330
Total								
Local Currency	590	980	190	60	-	1,820	60,080	61,900
Foreign Exc.	4,030	8,730	4060	-	2,320	19,140	-	19,140
Grand Total	4,620	9,710	4,250	60	2,320	20,960	60,080	81,040

AID Funds Only

Project Paper
Summary Cost Estimate
and Financial Plan
(in U.S.000)

Table 1, Page 1 of 1

Inputs	FX	LC	TOTAL	Grant Agreement Illustrative Project Financial Plan (in US$000) Total	Amendment Financial Plan Summary (in US$000) Table 1 Total	Grant Agreement Plus Amendment (in US$000) Total
Capital Costs						
Structure Replacement	-	65,065	65,065	16,500	60,080 1/	76,580
Inflation	-	27,935	27,935	2,900	12,040 3/	14,940
Total	-	93,000	93,000	19,400	72,120	91,520
Other Costs						
Contract Services	7,936	1,153	9,089 1/	8,860	4,620	13,480
Commodities	2,985	10	2,995 1/	2,995	9,710	12,705
Participant Training	1,091	-	1,091	1,090	2,320	3,410
Miscellaneous Services	20	200	220	170	60	230
Salaries & allowances	-	-	-	-	-	-
Operating Costs	-	-	-	-	4,250 2/	4,250
Subtotal	12,032	1,363	13,395	13,115	20,960	34,075
Contingencies	1,574	200	1,774	1,770	2,050	3,820
Inflation	3,254	577	3,831	3,715	6,350	10,065
Total	16,860	2,140	19,000	18,600	29,360	47,960
Project Total	16,860	95,140	112,000	38,000	101,480	139,480

1/ $1,480 of SR funds listed under contracts and commodities, $980 and $500, respectively.

2/ Listed as "Support Cost" in Amendment Tables.

3/ Under Structure Replacement line item PP inflation figure was 30% of total, in Grant Agreement it was calculated at 15%. In the PP Amendment inflation has been calculated at 17%.

Table VI

GOE Funds Only

Inputs	Project Paper Summary Cost and Financial Plan (in US$000) Table 1, Page 1 of 1 Total LC	Grant Agreement Illustrative Project Financial Plan (in US$000) Total LC	Amendment Financial Plan Summary (in US$000) Table 1	Grant Agreement Plus Amendment (in US$000)
Capital Costs				
Structure Replacement	101,530	101,530		101,530
Inflation	44,100	44,100		44,100
Total	145,630	145,630		145,630
Other Costs				
Contract Services	-	-	-	
Commodities	-	-	8390	8390
Participant Training	-	-	-	
Miscellaneous Services	-		-	
Salaries & allowances	25,070	25,070	2030	27,000
Operating Costs	35,200	35,200	1370 1/	36,570
Subtotal	60,270	60,270	11,790	63,760
Contingencies				
Inflation	-	-	790	790
	26,100	26,100	2850	28,950
Total	86,370	86,370	15,430	101,800
Project Total	232,000	232,000	15,430	247,830

1/ Salaries and allowances plus operating cost shown as support cost Table 1 of Amendment.

Table VII

Total Project Summary Cost Estimate and Financial Plan
(in U.S.$000)
GOE Plus AID Funds 1/

Inputs	Project Paper FX	Project Paper LC	Project Paper TOTAL	Grant Agreement TOTAL	Amended Project Paper TOTAL	Grant Agreement Plus Amendment TOTAL
Capital Costs						
Structure Replacements	-	166,595	166,595	118,030	60,080	178,110
Inflation	-	72,035	72,035	47,000	12,040	59,040
Total	-	238,630	238,630	165,030	72,120	237,150
Other Costs						
Contract Services	7,936	1,153	9,089	8,860	4620	13,480
Commodities	2985	10	2995	2995	18,100	21,095
Participant Training	1091	-	1091	1,090	2320	3410
Miscellaneous Services	20	200	220	170	60	230
Salaries & allowances	-	25,070	25,070	25,070	2030	27,100
Operating Costs	-	35,200	35,200	35,200	5620	40,820
Subtotal	12,032	61,633	73,665	73,385	32,750	106,135
Contingencies	1,574	200	1,774	1574	2840	4414
Inflation	3,254	26,677	29,931	30,391	9200	39,591
Total	16,860	88,510	105,370	105,350	44,790	150,140
Project Total	16,860	327,140	344,000	270,380	116,910	387.290

1/ Table VII is a summation of Tables V &VI.

The work to be carried out over the next three years will contribute significantly to the goal of completing all deferred maintenance by the end of this decade and will improve the efficiency of water distribution. The sole purpose of the Telemetry system is better control of irrigation water. It requires a modest investment to facilitate and accelerate information flows through the irrigation system which will permit better control and improved distribution of irrigation water.

The other two components find their economic rationale essentially in the fact that they capitalize on previous sound investments. They seek, on the one hand, to reintegrate experienced professional staff and institutionalize their relevant project-based experience in the Ministry and, on the other hand, to test, on a field scale, the efficiency and effectiveness of improvements in the irrigation system at the meska level that have shown promise of being economically viable*.

E. Social Analysis
and

F. Environmental Impact

The activities to be carried out under the Amendment do not, in any way, change the thrust of the presentation in the original Project Paper.

VI. Implementation:

The implementation of the Amendment, in terms of expenditures, is shown in Table II (Section V, D, above), and, is in terms of the implementation of the amendment is shown in Table II (Section V, D, above) in terms of expenditure and, in terms of timing, in the following chart.

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* Specific illustrative examples drawn from EWUP internal reports are given in Appendix I.

IMS IMPLEMENTATION SCHEDULES (KEY DATES)

Action	Dates of Actions				
	Project General	S.R. Capital Activity	Water Research Institute	Regional Irr. Imp. Project	Telemetry Data Collectio System
1983					
1. MOI designates directions					
2. NEAC aprroves PP Amendment	12-20		12-15	12-15	12-15
1984					
3. Authorization signed	1-5				
4. Prequalification for TA Contractor advertised					
5. AID/MOI sign EFY 84/85 SR Agreement			1-10	1-10	1-10
6. Selection of Commodity Procurement Sp.-IQC	1-15	1-10			
7. Mission & MOI sign Amendment Agreement	2-15				
8. Pre-qualification proposal received					
9. Commodity proc. sp. in Egypt	3-1		2-25	2-25	2-25
10. Qualified TA firms receive RFP					
11. Project work plans prepared by MOI			3-15	3-15	3-15
12. Annual work plan submitted by MOI			3-15	3-15	3-15
13. Selection of pro. service agent			4-1	4-1	4-1
14. MOI TA selection rec.	5-1				
15. IFB prepared for commodity purchases			6-15	6-15	6-15
16. Suppliers selected	6-15				
17. TA contracts signed	9-1				
18. Contracts for commodities signed	10-1				
19. TA team in place	11-15				

Action	Dates of Actions				
	Project General	SR Capital Activity	Water Research Institute	Regional Irr. Improvement Project	Telemetry Data Collect System
1985					
20. IFB prepared for commodity purchase	1-15				
21. Annual work plans submitted			2-1	2-1	2-1
22. Commodities in-country	3-1				
23. Suppliers selected	3-15				
24. Contracts for comm. signed	5-1				
25. Field review of 84/85 work		6-1			
26. AID/MOI sign 85/86 SR agreement		7-1			
27. Commodities in-country contract signed	10-1				
1986					
28. Annual work plan submitted			1-15	1-15	1-15
29. IFB Prepared for commodity purchase	1-15				
30. Suppliers selected	3-1				
31. Contracts for comm. signed	5-1				
32. Field review of SR		5-15			
33. AID/MOI sign 86/87 SR agreement		6-15			
34. Commodities in-country	10-1				
1987					
35. TA team complete contracts			3-15	3-15	3-15
36. SR Program completed		3-15			

VII. Evaluation Plan:

Evaluation requirements related to the Structural Replacement component of the IMS Project have been fully met so that the principal condition for consideration of the present Amendment has been fulfilled. The relevant report is appended to this Project Amendment. Since completion of that Report, additional information attesting the success of this program have been received. A letter detailing the water savings and increases in system efficiency that have been achieved as a result of successful completion of the initial phase of SR under the Project is reproduced in Appendix IV.

The interim evaluation of the components of the Project (as a whole) has been scheduled for the second quarter of FY'85.

VIII. Conditions, Covenants and Negotiating Status

A. Conditions Precedent: as in I (q) .

B. Covenants: as in I (q)

C. Negotiating Status:

The Project Amendment as outlined in this paper has been thoroughly discussed with the Minister of Irrigation, specifically with a committee, appointed by the Minister, headed by the Senior Undersecretary. The Committee has reviewed the draft and is in full agreement with the proposed design. The Minister has stated that he wants the project implemented as soon as possible. The Mission expects to proceed to signature of the grant agreement immediately following authorization.

LIST OF PROPOSED EWUP TECHNICAL REPORTS

(Titles are preliminary)

Propsed TR No.	Title	Author
14	The Challenge of Implementing an Irrigation Program in an Egyptian Village	J.B. Mayfield & M. Naguib
16	Irrigation System Improvement by Simulation & Optimization, I. Theory II. Application	J.M. Reddy & W. Clyma
17	Optimal Design of Border Irrigation System	J.M. Reddy & W. Clyma
18	Population Growth and Development in Egypt: Farmers' and Rural Development Officials' Perspectives	M.S. Sallam, E.C. Knop & S.A. Knop
21	El-Hammami Pipeline Design	Fort Collins Staff Team
25	Problem Identification Report for El-Minya	R. Brooks
27	Alternative Approaches in Extension & Rural Development Work: An Analysis of Differing Perspectives	M. S. Sallam & E.C. Knop
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Appendix II

A. Economic Rationale

1. Overall

Optimally, economic justification of the project would be based on a comparison of economic benefits with the costs necessary to achieve these benefits. Benefits would include the value of water saved, the value of additional agricultural production, reductions in energy costs as less water is lifted and passes through the drainage system unused, lower transport costs as bridges are replaced/maintained, greater returns from irrigation investments made using better plans and the increased output of better trained people. Costs would be those associated with the project plus perhaps certain expenditures incurred by producers or consumers. Unfortunately, while the project costs can be calculated with some accuracy, the data are simply not available to precisely determine benefits. The production benefits of a better gate or a better turnout depend on the before and after situation and implies identification of the specific structures to be repaired/replaced. Similarly, the quantities of water that will be saved, the value of the water and energy saved or the reduction in transport costs cannot be projected.

In this situation the use of least cost analysis provides an alternative method of justification. But again the data for a clean-out conclusion are inadequate. Generally, the proposed method of resolving the problems are the lowest cost than certain other alternatives. In fact, the solutions identified are the lowest cost methods judged to be capable of solving the problem. The uncertainty derives from the judgemental aspect which could be incorrect because not all alternatives can be considered or accurately costed.

Because of the above factors there is a certain amount of faith required that the project is economically justified. The evidence cited below makes a partial case but not an absolute one. Nevertheless, it is USAID judgement that the illustrative materials do establish an acceptable economic rationale.

2. Structural Replacement

The only way in which a rigorous economic analysis could be made of these components would be to analyze separately the effects of each of the structures involved and then seek to weight appropriately each of these analyses in order to derive a meaningful general statement. Under circumstances where hundreds of separate structures are involved with complex linkages not only within the overall system but below, at the meska and the farm level, such as effort would clearly be impractical. Nor, given that Egyptian farming depends wholly on the regulated supply of water from the Nile, would it seem necessary to go much beyond the descriptions that follow, to justify the economic cost of improving the efficiency of the irrigation system.

The principal areas of project impact from major repairs and replacement of structures in the irrigation system are: (1) increased control of water discharges and greater efficiency of the canal system, allowing increased agricultural production from the agricultural lands; (2) water saved and over time made available for alternate uses; (3) savings resulting from correcting minor maintenance problems before they develop into major problems; and (4) village to field and farm to market transportation cost saving resulting from replacement of unsafe or unusable bridges.

Deferral of routine maintenance of the canal system over the past 10-15 years has resulted in deterioration of parts of the system to the

extent that it can no longer fully service all of the cultivated areas for which it was originally intended. In some instances lack of control of the system such as a headgate which will not properly close, has caused excess irrigation at the beginning of a canal or ditch and a shortage of water at the end of the conveyance. Water leakage through gates that do not close properly not only wastes water, but can contribute to waterlogging and lower agricultural production. Water lost at the head of canals and ditches prevent farmers at the end of the conveyance from receiving the full complement of water needed for year around cultivation according to the crop rotation norms of planting to winter, summer and nili crops. These areas, being short of water during the critical months of May through September when demand throughout Egypt is at its highest point, are sometimes left idle and thereby lower the multiple cropping intensity. A recent study by the Ministry of Agriculture on multiple cropping intensity (MCI) in Egyptian Agriculture found:

> "There is much to suggest that factors associated with improved water control and improved soil and moisture conditions would lead to higher MCI. The increase in cropping intensity which accompanied the Aswan High Dam in the 1960's is indicative of this. Improved year around water availability served to decrease the amount of land which had theretofore been temporarily idle during the summer period, and it permitted more double cropping." 1/

1/ James Fitch & Atef Abdel Aziz, Multiply Cropping Intensity in Egyptian Agriculture: A Study of its Determinants, Oct. 1980, Arab Republic of Egypt, Ministry of Agriculture.

Work by the Egypt Water Use and Management Project (EWUP) suggests that yields can be increased even while using less water. 1/ A field experiment to evaluate rice production under alternative methods of planting seeds or transplanting seedlings was conducted. In this experiment, the application of irrigation water was controlled and the treatment areas using the least amount of water also had the greatest net returns per feddan. The water use and net returns per feddan for the four treatments in the experiment are shown below.

Item	Treatment A	B	C	D
Return above cost per feddan in Egyptian pounds	15.5	3.45	18.42	45.27
Cubic meters of water applied per feddan	8,000	10,000	9,000	7,000
Yield Grain (tonnes)	1.68	1.41	1.53	2.08
Straw (tonnes)	4.86	3.65	4.34	3.37

Another study 2/ made by EWUP in the Mansouria area of the Giza Governorate, revealed that farmers at the end of a branch canal received less water than those at the beginning. They found both the cropping pattern and crop intensity ratio were affected. The intensity ratio at the upper end of the branch canal was 2.20 compared to ratio of 2.13 at

1/ M. Samir Abdel Aziz, Ragy Darwish and Gene Guenemoen, Progress Report of Rice Planning Trials at Abou Raia, Kafr El Sheikh Governorate, 1979, Egypt Water Use and Management Project Staff Paper #7.

2/ Egypt Water Use and Management Project, Staff Paper #11, Economic costs of Water Shortages along Branch Canals, June, 1980.

the lower end. This means over 3 percent more production could be expected simply because the land is more intensely cropped. On a nationwide basis, if one-third of the land were affected by water shortages, because it was at lower ends of canals, a one percent increase in total output would result.

Similar potential benefits to the agricultural output of the nation are indicated by the difference in cropping patterns. In the Mansouria area, lower-and farmers, without access to alternative sources of water have about 86 percent of their land in maize and 21 percent in vegetables during the summer season. Conversely, their peers with water have only about 54 percent of their land in maize and about 37 percent in the higher value crops of vegetables. The difference in net farm income per feddan of vegetables and that of maize ranged from LE 46 to LE 344. Asuming a difference of LE 200, the income foregone from not producing vegetables in the Mansouria district alone could amount to LE 296,000 per year. If this were to be projected to the nation the difference in the value of production would be LE 1100 million. However, it should be noted that in all probability, that the amount of vegetables grown would be constrained by labor availability and markets. Thus while this extrapolation is interesting and illustrative of possible benefits it should be interpreted with reservations. Nevertheless, the two examples do demonstrate the potential gains from higher yields and different cropping pattern which can be achieved by improving the efficiency of water distribution, and control.

Another type of benefit ~~from an effective O and M effort~~ are long-run savings in expenditures. The lack of a minor repair on a structure can result in the requirement for a major repair or even complete replacement of the structure. To illustrate, a head regulator that will have to be replaced at a cost of over L.E. 20,000 due to a foundation problem was viewed by the design team. The problem was caused by seepage under the

foundation. Had this been corrected several years earlier at a cost of around LE 5,000 the structure could have been saved. Similarly, a bridge had been damaged by a vehicle to the point the steel reinforcing bar was exposed. The current estimated cost of repair is two thousand pounds. However, if left unrepaired the bridge will gradually deteriorate and within 5 years will probably become unsafe and have to be replaced. Without going into detail on each structure to be repaired, it would be impossible to make a firm analysis of how much would be saved in structure replacement if better O+M maintenance were performed. Nevertheless benefits will occur.

Finally, as indicated, the Ministry of Irrigation is responsible for bridges over canals and ditches except for major roads. These bridges are used by farmers to move equipment and agricultural products between their villages and between farms and markets. Should the bridges collapse or become unsafe, alternative longer routes of transportation will be required. The difference in time and costs required between using the existing system of bridges and alternative routes of transportation if the bridge fails, is a benefit. A calculation of the benefits for this purpose has not been made because it would require a study for each bridge to be replaced or repaired. The particular bridges have not been identified but it is obvious that some benefits will derive from project investments.

3. Conclusion

In summary, a review of the Egyptian irrigation system reveals that the system is (1) in need of repair and possible redesign and (2) farm income and water conservation could be improved with improvements in the water distribution and control system. This project proposes to concentrate on developing the Ministry of Irrigation to the point where it can have full control of the water and manage its delivery

effectively. With a more reliable water system, the farmer will be able to increase his production and receive a larger net return as well as conserve water. This should enhance the payoff of past assistance in canal maintenance. Also the institutionalization of the CM & SR system within the MOI should ensure its perpetuation. Therefore, it is concluded that the project is economically cost effective within the constraints assumed to exist.

4. Cost Recovery and User Changes:

There is no provision for irrigation water user charges in this project. Historically, Egyptians have rejected charges for water because it runs counter to Islamic religious tradition. Nevertheless, it may be possible to gain acceptance of a distinction between charges for water use, which have been rejected, and changes for water delivery. These latter are in fact applied, albeit on a token scale to urban consumers, and are implicit in the present distribution system for water to farmers' fields. The annual cost of lifting water from the meskas to the land by pumps, and animal and hand powered waterwheels and other devices, may amount to as much as LE 100 million. The North Zifta Study component of the project is investigating the possibility of changing from lift to gravity irrigation, and will explore the possibility of the covering some costs for water delivery.

APPENDIX III

DRAFT

APPRAISAL

OF

THE STRUCTURAL REPLACEMENT (S R)

PROJECT

BY

FRED M. TILESTON

IRRIGATION STRUCTURAL CONSULTANT

MOHAMED NASSER EZZAT

SENIOR ENGINEER MOI

EVAN M. KRITH

TECHNICAL ADVISOR TO THE SR PROJECT

MINISTRY OF IRRIGATION

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

CAIRO, EGYPT

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June 16, 1983

Attached is an Appraisal of the Structural Replacement (SR) Project being carried out by the Ministry of Irrigation in Five Directorates in the Delta.

The Appraisal Committee enjoyed the full cooperation and assistance of MOI personnel in the five Directorates and at Headquarters.

The Committee was pleased with this cooperation and assistance and wishes to express its thanks to the MOI personnel for their help in this effort.

Fred M. Tileston
Irrigation Structural Advisor

Mohamed Nasser Ezzat
Senior Engineer MOI

Evan Krith
Advisor to the SR Project

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INTRODUCTION

The structural Replacement (SR). Program is initially being carried out in: East Dakahlia, West Dakahlia, Sharkia, Ismailia, and Beheira Directorates in the Delta. The SR program is being conducted within the Ministry of Irrigation (MOI). Conduct of the SR activity is the responsibility of the MOI. Contract services personnel provide advisory services under the administrative guidance and policy of the Director of the SR activity.

The irrigation Department is responsible for providing technical guidance and supervision of the field organizations of the MOI. The Irrigation Sector is under the direction of a Senior Undersecretary, who supervises water deliveries and technical guidance to field activities.

Field operations are conducted under the supervision of regional Undersecretaries reporting to Cairo. Each Undersecretary directs one or more field directorates. The Directorates are managed by a Director General for Irrigation residing in the Directorate and reporting to the Undersecretary.

The Directorates are the field units, with operational responsibilities for the irrigation systems. They are responsible for the O & M of the canals, structures and drains. They are staffed to conduct management functions, such as contracting, disbursement and accounting for funds, personnel administration and monitoring of contractor performance.

The Undersecretary supervises a Director General to whom two inspectors are responsible. They in turn supervise a Director of Works and a number of District Engineers (DE's) with responsibility for direct oversight of system O & M and contractor site inspection.

Over 15 years, budget limitations and an emphasis on major canal maintenance and recently, increasing expenditures on tile drainage in farmers, fields have reduced the amount of funds for (SR). Many structures are inoperative or partially functional.

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Studies by the MOI show that SR has been identified as one of the principle constraints to satisfactory performance of irrigation.

The (SR) program is designed to replace and/or rehabilitate the small and medium sized structures, consisting of: intake regulators, head regulators, weirs, tail escapes, spillways, bridges and channel crossings. These structures are constructed of reinforced concrete, masonry, pipe, and steel. A paramont problem confronting the irrigation sector is the large amount of accumulated SR backlog. A survey in 1981 by the MOI, estimated that the cost of the backlog of deferred small and medium SR amounts to LE 44 million, at 1981 costs.

The SR program partially funded by AID will be accelerated at a moderate pace. The most severe SR problems will be addressed during the first two years, before expanding the program to include the remaining twenty Directorates. The MOI is directing special efforts to achieve improved quality control and ensure compliance with MOI specifications.

The Project Agreement specifies that:

"To provide senior responsible managers of the MOI and AID, assurance that a satisfactory level of quality control is being exercised to meet MOI specifications. A field review of SR performance will be carried out annually. The review will include one short term advisor under the Project, a senior MOI engineer from outside the Irrigation Sector and, if determined appropriate by the MOI, the SR advisor from the Contractor staff. An impartial report will be submitted to the Coordination Committee and a copy to AID." A committee: Fred M. Tileston, Irrigation Structural Consultant; Mohamed Nasser Ezzat, Engineer, MOI, Permanent Joint Technical Commission for Nile Waters; and Evan Krith, Engineering Advisor to the SR Activity, Contractor staff, was established.

Scope of Work

The scope of work given to the Committee was to:

* Become familiar with MOI specifications for the construction of (1) intake head regulators, (2) steel gates, (3) tail escapes, (4) weirs, (5) syphons and aqueducts and (6) canal bridges.

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* Determine if sufficient quality control is being maintained on individual structures, by visiting structure sites in five Directorates where construction is underway or has been completed.

* Determine if the SR Program is meeting the objectives and requirements set forth in the project agreement by utilizing field inspection data along with other information available.

* The Committee will prepare a report on findings.

1. The committee will prepare an impartial technical report to be submitted to the MOI and AID. The report will be submitted in draft, and allow consultation time to discuss the report with the MOI and AID.

2. The report will contain sufficient informatin to determine:
   (a) The output of the program.
   (b) Whether the objectives are being met.
   (c) Reasonable and applicable recommendations that could be incorporated into organizing the program.

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SUMMARY RECOMMENDATIONS

- The criteria, design and construction procedures specified by the MOI general specifications are adhered to.

- There is a range of quality of concrete from very good to good within acceptable standards. Quality control needs further improvement, with advise of the Consultant.

- The concrete specifications need to be enforced and/or altered to provide engineers with the means of getting the contractors to improve appearance of the finished concrete.

- Improved construction standards, with the advice and guidance of the Consultant are being progressively achieved.

- A shortage of skilled labor and the recommendations of the consultant to the SR program is motivating contractors to utilize mechanical mixing of concrete, which will help to improve quality of concrete.
- Vibrators are being used to place concrete in an around reinforcing steel.

- Bridges are being designed and constructed to support vehicular traffic, generally 30 ton capacity, 70 ton capacity also have been constructed.

- The aggregate and sand utilized for concrete mix is well proportioned and uniformly acceptable. Field and strength tests need to be initiated to help assure that good quality of concrete is maintained.

- The consultant needs to utilize a portable concrete test hammer on field trips to help spot check the quantity and strength of concrete. This test hammer can be purchased on the local market, with AID approval.

- Economic improvement of designs could be achieved, if improved quality of concrete were assured.

- The Fahmy Henen sluice gate is excellent and its design cannot be faulted.

- The detailed engineering designs and plans are acceptable. The field engineer and inspector check and certify each structure's completion.

- Channel bank protective stone pitching is uniformly acceptable.

- The contracting procedures followed by the Directorates are adequate and are applied uniformly throughout the five Directorates.

- Record keeping on a monthly basis needs to be maintained in the Directorates office for management control and review of progress of work.

- Overall in the five Directorates the SR program is 62.7 % completed.

- Contracts for a group of structures in a relatively small area are grouped in some Directorates to improve contract management. This practice need to be encouraged in all Directorates.

- There are adequate and capable engineering personnel to carry out the SR program in the five Directorates.

- The program of work will be completed in the five Directorates by about December 1983.

- The lag period of the program in the Directorates ranges up to three months.

- No cash flow problems are experienced by the Directorates. The MOI has budgeted sufficient funds. Contracts are being carried out on schedule.

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PROCEDURE AND QUALITY OF WORK

SR Structural activity was reviewed by the Committee in the Directorates of East Dakahlia, West Dakahlia Sharkia, Ismailia and Beheira. Technical discussions were conducted with MOI Directorate staff, at the central offices, and during visits to the work sites. Designs, plans, completed structures and those under construction were reviewed. Detailed observations were carried out during the visits and at the work sites.

The criteria, design and construction procedures specified by the MOI general specifications are adhered to. Although the observed concrete work is uniformily acceptable, there is a range of quality within acceptable standards. This aspect is rooted in the degree of contractor management. The MOI specifications need to be enforced or altered to provide the engineers with the means or specifications to get a good appearing jobs. The engineer-inspectors will need to urge and enforce the contractors to bring the appearance of the finished concrete up to improved acceptable standards.

The criteria, design and construction procedures specified in the MOI standards of specification are adhered to. AID has requested and the MOI has agreed to this criteria of standards, so reimbursements may be approved.

The Directorate staff is requiring the contractors to follow and apply the MOI design and construction procedures specified in the MOI standard specifications. This is indicated by the observed uniformity of SR structural implementation throughout the five Directorates. Although as noted, there is variance of application of the uniform standards. This is expected, as the contractors performances will vary from minimal performance to superior performance. The structural work is observed to be functional and acceptable.

The Directorate staff advised by the Consultant is demonstrating improved construction procedures. For example, mechanical mixing of concrete and use of concrete vibrators is being more widely utilized. This will improve the quality and strength of the concrete. Some contractors are experiencing skilled labor shortage, as skilled laborers are going abroad to better paying jobs. This has motivated contractors to employ more mechanical equipment to amelioriate the labor shortage.

The bridges are constructed to modern standards to support vehicular traffic. For example, the majority of the bridges are designed for a 30 ton capacity and 6 meter wide road-bed, with two one meter wide walk-ways and rails. Some bridges serving foreseeable small farm communities may be 15 ton capacity and 3 meters wide. All bridges are designed to carry vehicular traffic. This is good, as those structures will be serviceable for a prolonged period, without load limitation.

The bridge abutments and piers are uniformly plain concrete. The forming to retain the concrete is the facing brick. The brick work is the retaining walls or forms for the concrete. This is an interesting practice, and does produces a pleasant appearing brick faced structure. The back walls of the abutments may be battered, if very high. The pier walls are usually vertical structure, faced with brick. This practice has been carried out for a very long period. Brick structures over 60 years old were observed in very excellent condition. The bricks still retain a hard faced, good appearing finish. Some of the newly constructed bridges are being constructed on those old abutments and piers, where they are structurally sound. The abutments and piers are capped with plain concrete, usually 30 cm thick to provide support for the reinforced concrete beams, decking, sidewalks and rails that are constructed on the abutments and piers.

The plain concrete without reinforcement is placed without vibrators. Vibrators are specified and used to move the concrete mix in and around the reinforcing steel in the beams, decks, sidewalks and rails. Vibration equipment produces good appearing and acceptable concrete with little honey-comb. The appearance of the concrete in

the rails and bridge support beams and decks ranges from excellent to rough appearance. All structures are functional and acceptable. A plain concrete finish can be very beautiful as well as functional and the entire structure will present a better appearance for public inspection. It is recommended that the MOI specify improved appearing concrete finishes on the concrete structural work, particularly where it may be viewed by the public.

The concrete mix is largely blended and mixed by hand and placed by head baskets. This is customary and traditional and good concrete can be produced with this procedure. It is difficult to maintain uniformity of mix, but this is not so essential with the plain concrete structures. In reinforced concrete, a uniform mix and placement is essential to assure uniform and specified strength of concrete. Vibrators must, and are being utilized to move the concrete mix in and around the reinforcing steel. Mechanical mixers are being increasingly utilized to mix the batch. These steps will improve quality of concrete.

The aggregate and sand used in the mix is washed and graded and is adequate for the mix. A well proportioned mix according to the specifications will produce acceptable and specified strength concrete. To assure that concrete meets the strength specifications, cylinders need to be made from representative concrete mix and tested under a specified procedure. Accompanying this procedure, slump measurements need to be conducted, in the field, of the mix to assure the water-cement ratio is appropriate to the mix. The Directorates were utilizing measuring boxes to proportion the aggregate, sand and cement. The engineers also know that the mix should be as dry as possible in order to maintain the water-cement ratio as low as possible, to assure higher strength concrete.

There is no evidence that slump or strength tests are being carried out to assure that the concrete produced will be fully acceptable. The consultant will need to conduct training of Directorate staff on how to carry out slump tests at the job sites and prepare proportionate mix test cylinders to be tested in a central materials testing laboratory.

It is recommended that the Directorates establish, with the advice of the Consultant, a simplified concrete test procedure that can be practically applied.

The hydraulic structures are similarly constructed of plain concrete faced with brick utilized as the forming. The smaller hydraulic structures are entirely brick masonary and sometimes plastered to produce a good and acceptable structure. The Fahmy Henen steel gates used on openings of more than two meters, are very durable and good quality. This gate was designed and developed in Egypt by Engineer Fahmy Henen and cannot be faulted as it may outlast the pyramids. It is a very elemental and practical steel fabricated slide gate. some gates weighing up to several tons. Readily raised and lowered by a hand wheel through a simple high gear reduction ratio mechanism. Some of these gates over 15 years old, were observed to be in very good condition and well maintained. A number of the hydraulic check and intake structures are being enlarged to supply additional water to the sub canals. The smaller sluice gates are steel slide type operated by hand wheels and are very good and acceptable.

The brick work is acceptable.

It is recommended that the Consultant utilize a concrete impact test hammer in the course of his tours, to help assure that good quality of concrete is being achieved. It is recognized that the Consultant cannot and should not be an inspector, but the appearance of a concrete test hammer will have a beneficial effect on the staff supervising quality control of concrete.

The plans, designs and specifications prepared by Directorate staff are acceptable standards and detailed and complete enough to permit tendering to contractors. The plans are detailed enough so that the MOI and contractor's engineer can readily determine the necessary dimensions and detail of structure. The reinforcing bar schedule is shown on the plans in sufficient detail that the rebar can be cut and bent on the construction site. It is suggested the consultant check the concrete designs and advise refinements in designs, if there is a concurrent assurance of improved and sustained quality of concrete.

Stone pitching is used to protect the banks of the channelways both up and down-steam on the banks adjoining all structures. This work is universally good and acceptable. These were observed isolated rare instances, where as a result of inadequate compaction of the earth foundation the pitching was cracked and settled. These damaged sections will need reconstruction, and the engineers in charge have ordered the contractors to repair the damaged part.

CONTRACTING AND CONTRACT ADMINISTRATION:

The Contracting procedures followed by the directorates are adequate. The contracts which deal with the SR program are the "unit-price" type between the Directorate and, Government or private sector contractor.

The terms of the contract provide that the owner (MOI) will pay to the contractor a specific amount of money for each unit of work completed in a project. The units of work may be any items whose quantities can be determined, such as cubic meters of excavation or backfill, cubic meters of concrete or linear meters steel pipe, tons of reinforcing bars. etc.

Following MOI standard contracting practices, after completion of the drawings for a project, an advertisement is placed to local (Directorate) publications inviting qualified contractors to participate in the said tender. Brief description of the works; price to purchase contract documents; date of submital of the tender; and other related conditions are given in the public announcement.

The tender opening is public, where all bids are read aloud and recorded. An analysis and checking of the bids for general compliance and arithmetic verification is followed. The low bidder is awarded the contract, if he is capable to do the work. Dates of commencement, and completion of works are established, and an order to proceed with the work is issued.

Payments are usually made by the MOI to the contractor at specified intervals during the period of construction, with the amount of each payment depending on the value of work completed during the prior period. Under the terms of the contract, a retention of 5% is made from each progress payment. The retention is for maintenance security for a period of one year past the completion date of the contract.

Concluding the contracting procedures followed by the directorates are in full compliance of the MOI standards.

The area of contract administration/supervision needs improvements, as record keeping is minimal and testing of materials non-existent.

The SR program projects are spread out over considerable area, with limited access. Efforts are made to have continuous supervision and resident staff at each structure.

Testing of materials, also need to be understood and be part of the construction management by the Directorate/District Engineers. There is a series of tests, very simple, which require no special testing equipment and which can assure that the structural materials in concrete or masonry meets the basic requirements of quality and strength . More sophisticated testing including sampling and testing of concrete will be done in the near future, after mechanical mixing of structural concrete is introduced to the projects.

Concluding, the area of quality control of the works installed under the SR program, needs further improvements. The methods of improving the quality control will be simple, easy to carry out and will be under the general guidance and advise of the Consultant.

QUALITY AND CAPABILITY OF PERSONNEL

This appraisal involves only the five Directorates Sharkia, East Dakahlia and West Dakahlia, Ismailia, and Beheira, participating in the SR program. There are some differences in the quality and capability of personnel in those Directorates, however no attempt is made to place a rank in their capabilities.

The Directorates as field units of the MOI, with operational responsibilities irrigation system within their domain, are involved in the O & M of their respective canals, structures and drains, and also conducting construction management functions such as contracting, contract administration and monitoring of contractor performance. This is carried out through the Director General, two inspectors, two or more Directors of Work, and 8 to 11 District Engineers. This organizational structure existed before the SR program was initiated. A central organization existed, prior to the implementation of the SR program from which the participating Directorates could draw support.

Many of the engineers of the Directorates have overseas experience, worked mostly in other Arab countries. Some of them are very competent, and some key staff have been trained in the U.S.A.

There is no problem regarding the quality of and capability of the engineering personnel at the Directorates. The problem is that due to existing wage scales of MOI, a substantial number of Engineers are leaving the Directorates without being replaced.

It has been observed that the average age of the MOI engineers working in the Directorates is over 40 years old. We met very few young engineers (recent graduates) at the Directorates.

To enhance the capabilities of existing engineering staff at the directorates, to train new trained engineers, and to assist the Directorates develop their own capability in quality assurance, short courses in construction inspection, and quality control are recommended for the engineering staff from the level of inspector to the level of District Engineer.

OBJECTIVES AND REQUIREMENTS

Output

Total cost and number of structures, A review of the progress of work compared with the program agreed between the MOI and the AID has been carried out, a) on the basis of field trips to the head quarters of each directorate, b) from the quarterly reports of the five Directors, and c) from the reports and documents available at Cairo Head Quarters of the project. Table No. 1 shows the progress rate and accomplishment compared with the programed progress rate. Charts have been plotted from those records. (Pages 24 - 29)

Analysis of these charts can be summarized as follows:

Directorate East El Dakahlia (Page 24)

The total program amounts to 3,974,000 LE. The amount which will be completed is 3,775,300 LE. This amount represents 95% of the total amount of the contract. According to the conditions of the contracts, 5% is retained as a guarantee for one year after the date of completion of the job, for maintenance. Final check takes place by the engineer in charge. if the structure does not need any finishing or repairs, the contractor can get the retained money. From the chart, it is noted there is a lag period of three months. From the broken line of the program it can be deduced the program was not very realistic due to the fact that the end of the agreement is September 1983. The trend of the increase in the rate of the progress shows that the Directorate will finish the work as scheduled by end of 1983.

West El Dakahlia Director: (Page 25)

The total program is 4,234,618 LE and 95% of the amount is 4,022,887 LE. Although the amount of work completed up to May 1983, the date of preparing this report, is for 2,034,523 LE, which is almost 50% of the total program, but from the rate of progress, and the continuous increase at this rate, the target will be reached by 31st of December 1983.

Also the broken line of the program existed as the scheduled date of completion is September 1983; thus showing a lag period of 3 months.

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El Sharkia Directorate (Page 26)

The program is for 5,590.000 LE and 95% of this amount is 5,310,500 LE. It can be observed from the curve that the progress of work is ahead of the program. Through the period up to August 1983 where the progress might be delayed. The lag is 3 months. This is also because the end of the program is September 1983. If the work is carried on at the same rate, the program will be completed by August 1983. The projection of the dotted line of the actual progress at an angle smaller than the horizontal; than the rate of progress is speeded up in the last 3 months.

El Ismailia Directorate (Page 27)

The total program is for 1,061,000 LE and 95% of this amount is 1,007,950 LE. The rate of progress is very close to the program. The work will be finished by end of June 1983. i.e. 3 month before the target date. This may be, because the Project in this Directorate is small compared with other Directorates.

El Beheira Directorate (Page 28)

The total amount of work is L.E 6,137,500 the largest program of five Directorates and 95% of this amount is 5,830,625 LE. The amount of work finished by May 1983 is 3,811,000 LE. The progress is delayed by lag time varying between one month to 3 months. Some of the contracts have completion dates later than December, 1983. But still the date of completion is expected to be 31st December 1983.

The Total Five Directorates (Page 29)

The total amount of programmed work is for 20,997,118 LE and 95% of this amount is 19,947,262 LE. 80% of this amount will be reimbursed by the AID, which will be 15,957,809 LE. However, 5% of this amount will be paid to the contractors one year after the date of completion of each job. This means that about LE 797,890 will be reimbursed later. It is observed that a lag between the progress and the program, varies between 2 - 3 months. The progress is satisfactory and a real effort is being made by the Directorates to meet the target date for fulfilling their obligations to finalize the work according to program.

The remainder of the work, which is not finished or under construction have been contracted. Orders have been given to the contractors to start the work. Time of completion complies with the target dates shown on the curves. Factors retarding the rate of progress are:

The large number of small structures scattered in different places.

The water delivery rotations in the canals are 4 days full and 4 days dry, for rice plantations. The work can only be carried out during the dry period. The work is accelerated during the dry period in the months of December - January in each year.

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A large number of Fahny Henen steel gates are under manufacture in the state company of the (MOI). Those will be delivered very soon to some Directorates and will be installed in a few weeks. This might show increased progress in the next quarterly reports.

Number of Structures

The attached Table No. 2 shows the number of structures according to program and the number in process and the finished ones.

The number does not really represent the progress of the work. The cost of those structures, is more representative. These numbers are for the record and future review and evaluation purposes.

Cash flow

The MOI allocated funds ahead for the amount needed for the whole project. Each Directorate has the required amount needed for each fiscal year.

No cash flow problems have been noticed, and the budget allocated for each directorate is adequate for the program of work. The MOI has allocated the sufficient funds for its share (20%).

Director Generals of the Five Directorates assured the adequacy of funds. This can be noticed from the progress of work, as it is ahead of the program in some Directorates. Some programs of work are progressing ahead of the release of AID funds in some of the Directorates.

Objectives

Introduction

The strategy of the activity is to bring the structures in the irrigation system to a physical state to make possible efficient control of water, and to maximize the early favorable impact of the SR program by replacing those structures of greatest importance on a priority basis. It seeks to bring the system to the point, where by 1990, the SR backlog has been eliminated and replacement is equal to the rate of depreciation. This target is related to the need to make water increasingly available for use beyond the old lands as demands increases in the next decade.

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In this section it is shown how these objectives are met, the study concentrated on the progress of work and compared the output of the progress with the program.

The Output of the Program

It was found that up to May 1983, the work has been finished for 12,504,523 LE. and the total program is 19,947,262 LE i.e. 62.7 % of the work has been completed.

The amount of work completed is greater than this amount by at least 10%, because usually the payments are less than the amount of cost of work completed. There is a period between when the monthly statement is presented and/or the effect of payment. This is a general practice in all contracts.

Analysis of the progress rate curve of the five directorates shows that the rate of work done in the last two months is about 2.2 million Egyptian pounds. This means that in the next 7 months it is expected to finish the work of 7.7 million Egyptian pounds. i.e. the target can be reached before the end of this year, if this rate of implementation is maintained.

The output of the program is progressing satisfactory and MOI will be able to fulfill its obligations. No obstacles or problems were observed that would retard the progress of work. The remainder of the work is contracted to capable contractors. There is adequate staff, the cash budget is available and nothing can be seen that would deccelerate the rate of progres of the work. Even more progress is expected in the month of June, as some Directorates exert pressure on the contractors to finish the maximum amount of work before the end of the fiscal year. This is a general practice.

How Far the Objectives are Being Met

The appraisal concentrates on the objectives, pertaining to the progress and reaching the target date.

The main objective of the SR project is the implementation of new and/or rehabilitation of irrigation structure replacing the old ones to improve the efficiency of those hydraulic s.ructures. These structures were specified as, intakes and regulators, steel gates, tail escapes, weir, siphons and aqueducts, and canal bridges.

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Regarding the progress of the program; the MOI will fulfill its obligations, and the program will be finished by the target dates noted above.

Structures are constructed according to specification, and are acceptable quality. The completed ones are functional. The target is to replace those old structures by new ones to increase their efficiency. The MOI is getting very close to the target in the near future with this rate of progress and with the observed quality of work. The objectives are being achieved on the SR project very efficiently, regarding the progress, the quality control and organizational of the works.

Recommendations That Could Help to Organize the Program.

1. Monthly records need to be maintained in the Directorate and the Head Quarters of the project in Cairo. A detailed lists of the works finished and in process need to be available and up-to-date in the Directorate.

2. Progress charts need to be available and maintained in each Directorate, so the program of work can be readily reviewed.

3. Remarks need to be included in the quarterly reports, so the main problems deccelerating the works or any obstacles will be reported to the Head Quarters, so it could be solved through the powers given to the co-ordinating committee.

4. In some Directorates, the contracts for the structures of each District are grouped as one tender, to facilitate the administration and supervision of the work. The District Engineer supervises the work of his District. This procedure is recommended for other Directorates, as it facilitates and is efficient management control.

5. The number of technical staff to supervise the work is adequate for this program.

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Table 1

PROGRESS AND PROGRAM DURING THE PROJECT PERIOD

	Program			Progress									
DIRECTORATE	June 81/82	June 82/83	Total Sept. '83	28/2/82	30/6/82	30/9/82	31/12/82	31/3/83	May '83	The total Program	95% of the Program	Date of Completion	Remark
East El Dakahlia	1356,177	3696,177	3,775,300	328	965	975	1,264,500	1,632,000	2,039,000	3,974,000	3,775,300	31/12/83	
West El Dakhalia	1,370,000 ~~1370~~	3,810,000 3810	4,022,887	194	545,5	614,288	1,033,892	1,608,570	2,034,523	4,234,618	4,022,887	31/12/83	
El Sharkia	1,000,000 ~~1000~~	3,620,000 3620	5,310,500	683	1135,25	1,584,814	2,312,714	3,004,714	3,803,000	5,590,000	5,310,500	31/12/83	
El Ismailia	218,531	798,531	1,007,950	90	260	288,880	466,084	652,824	0,817,000	1,061,000	1,007,950	30/6/83	
El Beheira	1,894,000 ~~1894~~	4,427,000 4427	6,137,500	740	1583,5	1,827,287	2,540,740	3,421,775	3,611,000	6,137,500	5,830,625	31/12/83	
Total	5,838,708	16,351,708	19,947,262	2,305,000	4,489,250	5,290,269	7,617,930	10,293,183	12,504,523	20,997,118	19,947,262		

Sept. 83

1,899,000
2,528,000
4,427

Table 2

Progress Tables Expressed in Number of Structures

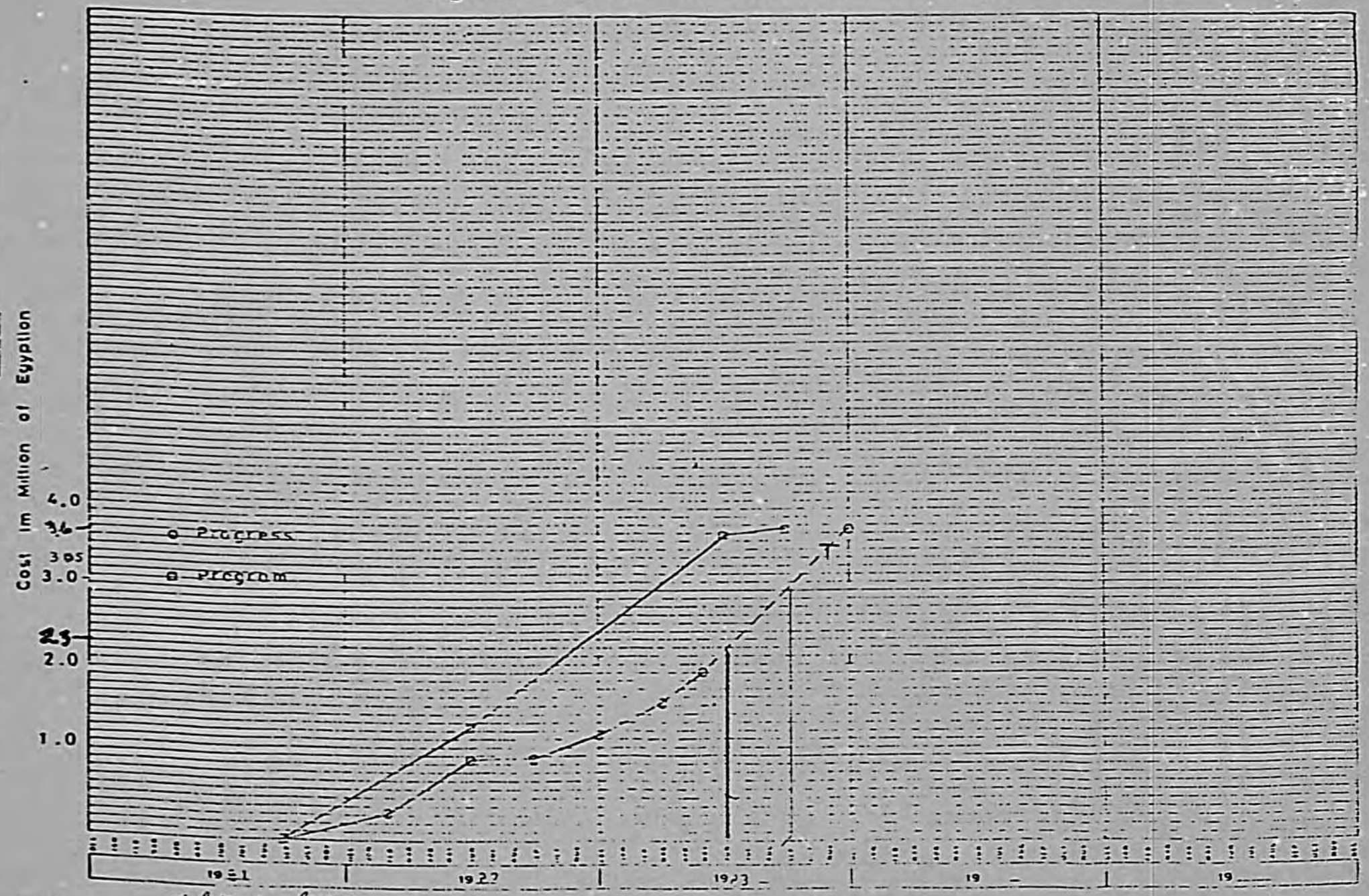
Completed and in Process

Directorate	Intake & Head Regulator		Steel gates		Tail Escape		Weirs		Syphons and Aqueducts		Bridges	
	(1) C & P	(2) Program	C & P	Program	C & P	Program	C & P	Program	C & P	Program	C & P	Program
East El Dakahlia	28	84	91	164	4	4			6	15	124	147
West El Dakahlia	70	133	19	113	25	56			8	21	108	139
El Sharkia	160	231	132	151	45	62			93	130	268	282
El Ismailia	426	614	13	13	7	7	1	1	5	5	20	22
El Beherai	32	50	151	209	18	37	2	2			176	195

(1) Number of structures completed and in process

(2) Number of structures in the total program

Progress Chart of East EL Dakahlia Directorate



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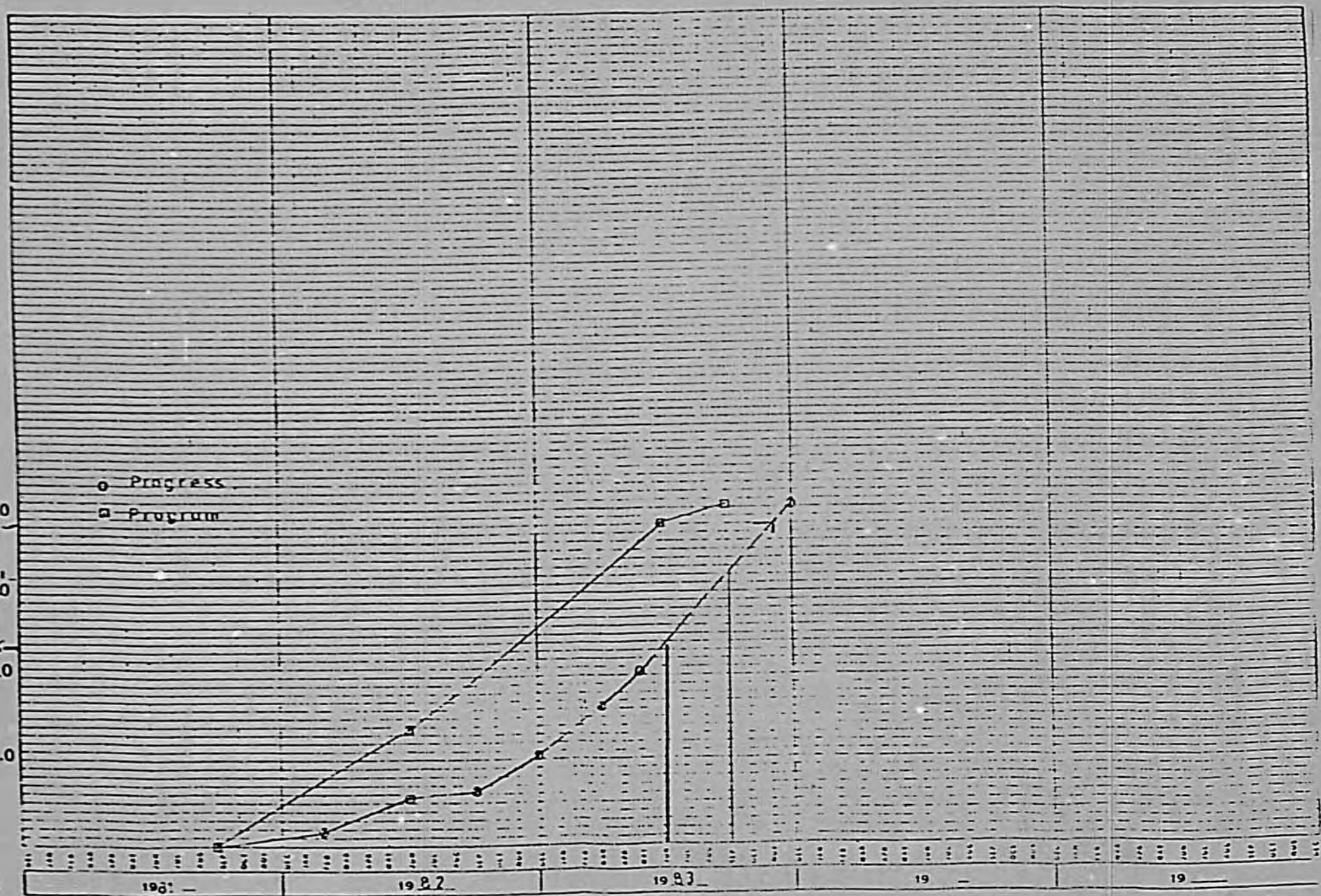
East Dakahlia

Progress Chart of West EL Dakahlia Directorate



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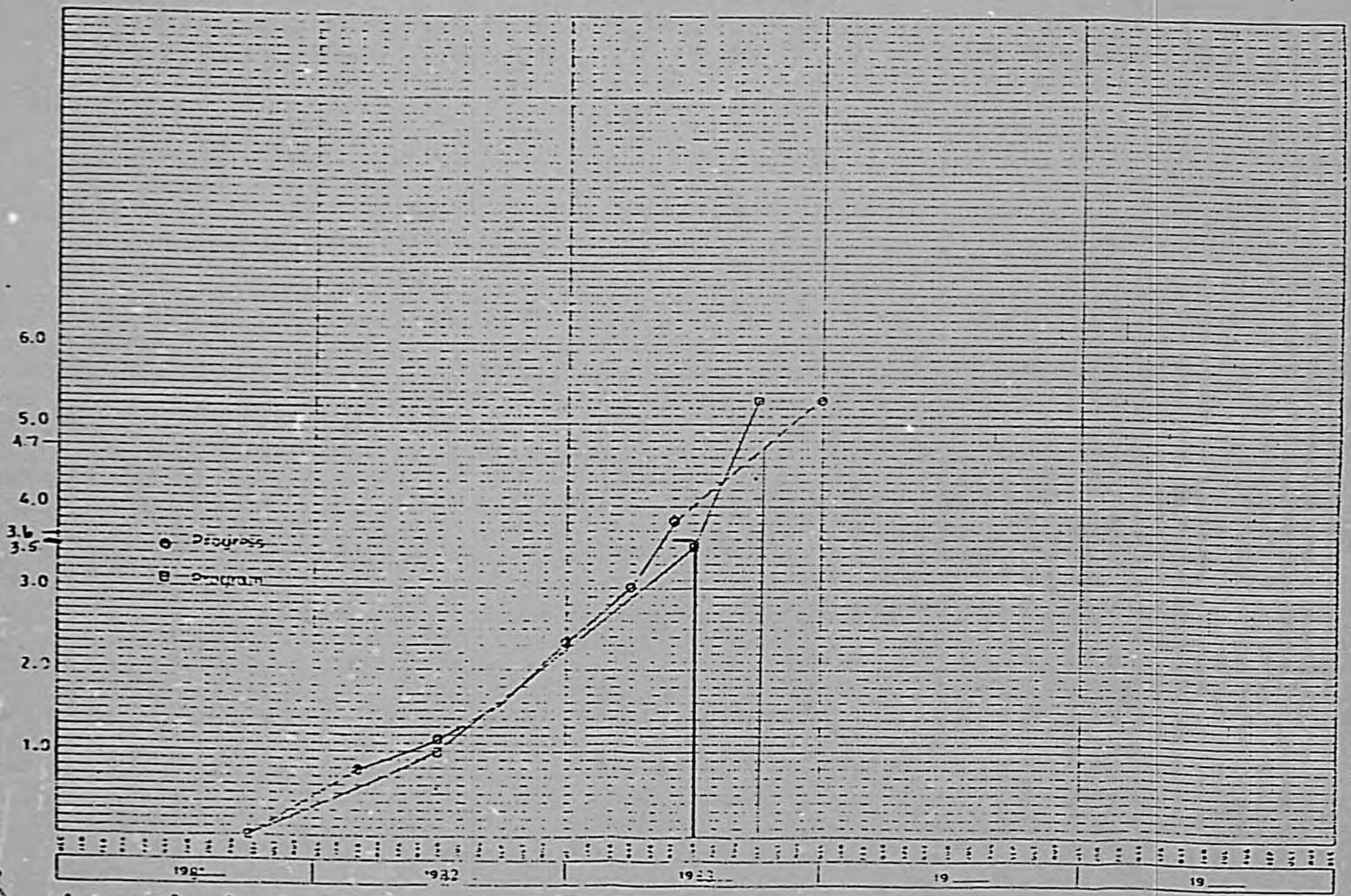
WEST DAKHALIA.

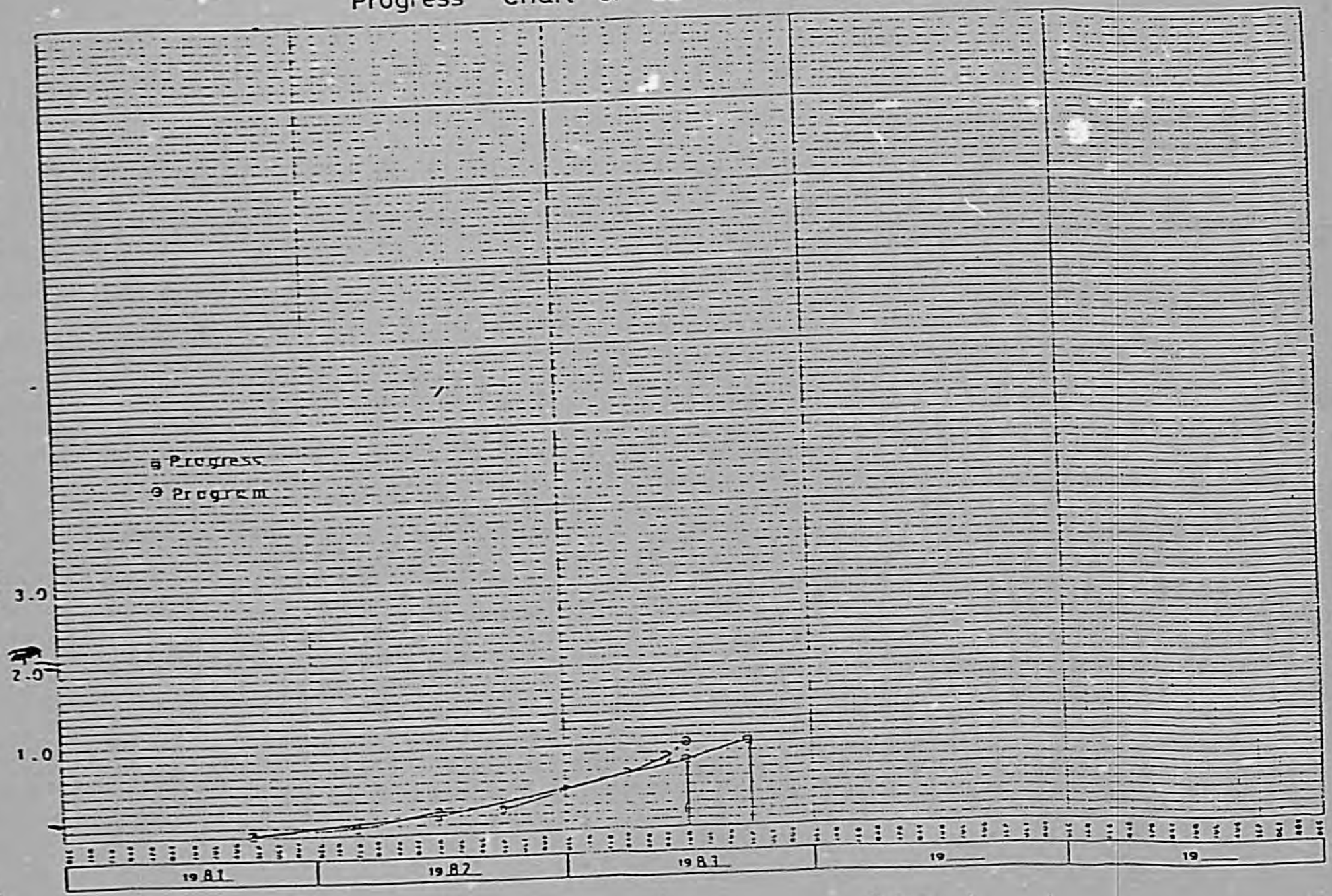
Progress Chart Of EL Sharkia Directorate



Projected Ann Plan - 3.620

SHARKIA.

Progress Chart of EL Ismailia Directorate



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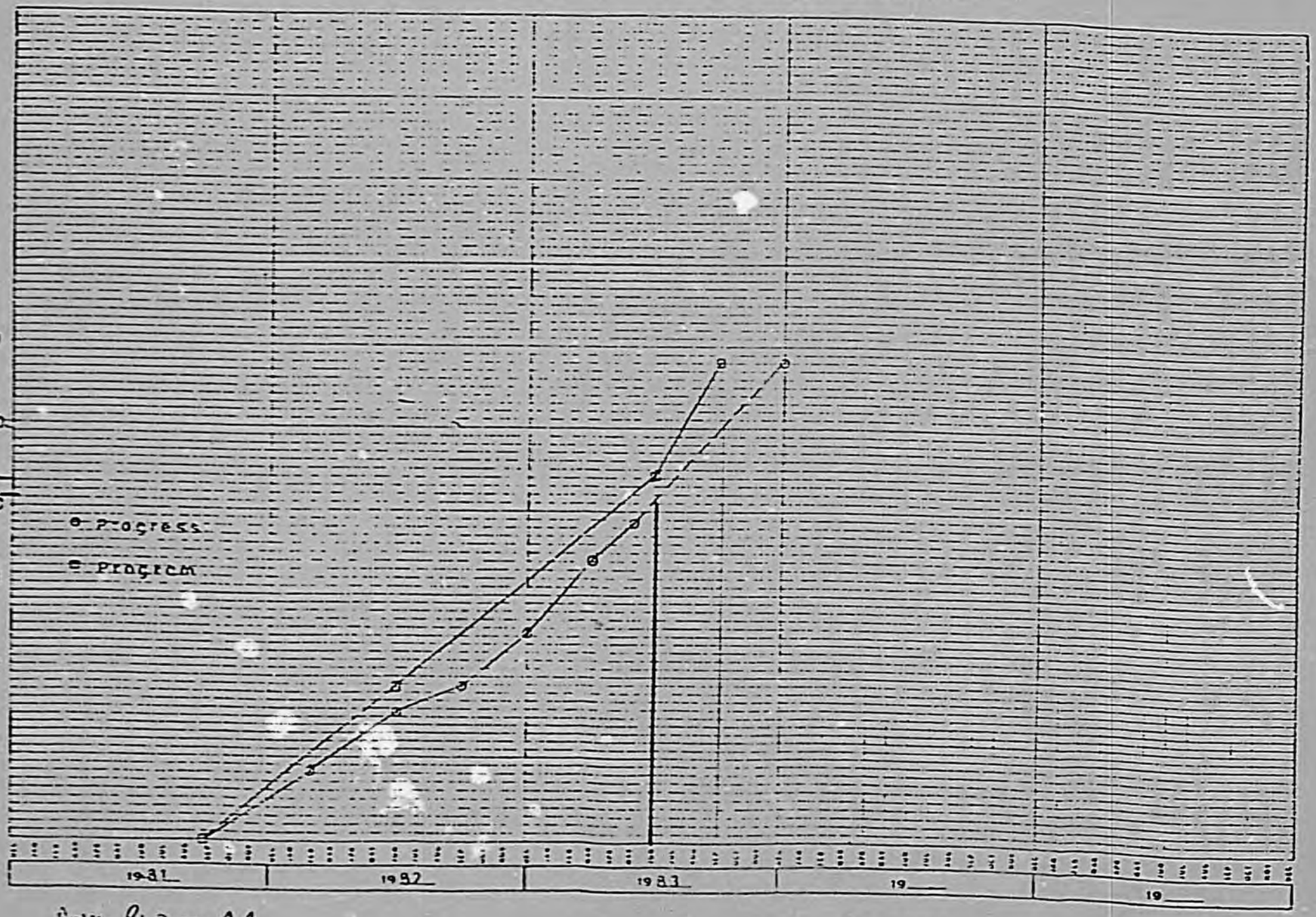
ISMALIA

Progress Chart of EL Behaira Directorate



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BEHAIRA

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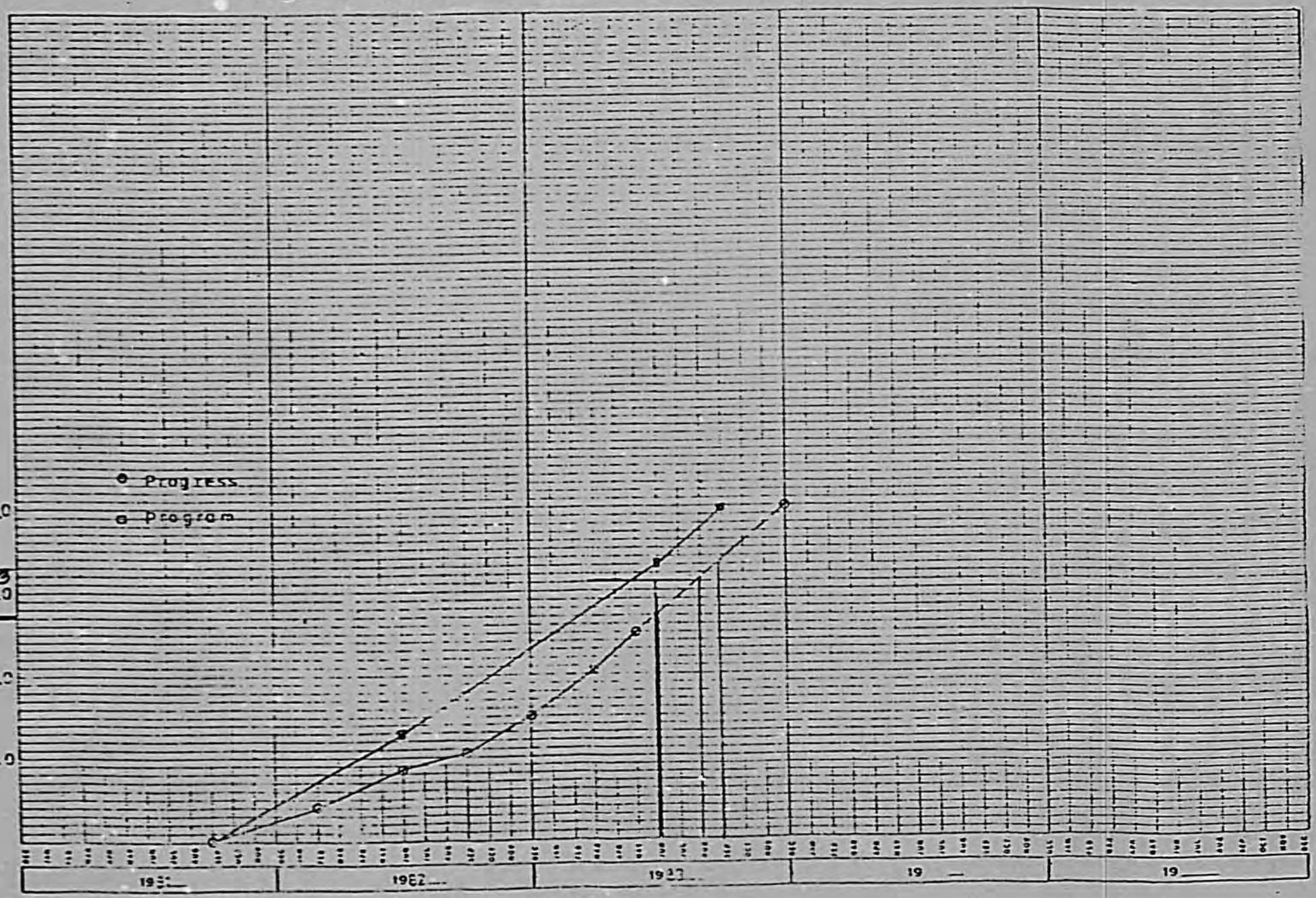
Progress Chart of The Five Directorates



163 - ANN. PLANS.

SECTION I

FIELD NOTES

East-El Dakahlia Directorate, Mansorah
Field Appraisal of the Structural Replacement (SR) Program

May 25-26; The Committee consisting of Messrs. Fred Tileston, Mohamed Nasser, and Evan Krith traveled with and/or met: Abdel Gamil Abdel Galil, Director General; Tewfik K. Elsadek, Assistant Director General; Ahmed Abo El Nil, Director of Works; and a number of District engineers.

The Committee toured to the Directorate. On the way, the following are noted:

The SR Program accelerates in the first quarter of the year; because the water is turned off for routine maintenance work (called dry period). Thus with absence of water in the canals, progress of the work will be accelerated. Quality of the construction, i.e. concrete and structural work, is being progressively improved. The consultant is addressing improved quality control of general construction procedures and material. Significant sustained improvements will be made over the next year. There are efforts to make the inspectorates aware and to more closely follow the specifications and to execute the construction according to MOI standards.

At the office of the Director General, the following are noted:

The SR structural program is planned, designed and detailed by Directorate staff. The field structural work is carried out by contractors and monitored closely by staff. Adequate staff of engineers, technicians and inspectors are at hand to carry out the work. No problems are experienced in monitoring the contractors to assure compliance with MOI specifications and construction procedures.

A summary of numbers and funds expended was collected from the Governorate records and estimated completion costs. These were utilized to determine the rate of progress and cost of the structural works to be completed. The works are tendered under contract. According to the contracted agreements, the estimated progress of work will be maintained.

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The principal problem is lack of hand labor utilized to carry out the construction work. A number of skilled labor people are going abroad, causing a shortage of construction laborers. This is motivating the contractors to utilize mechanical concrete mixers for concrete work and small backhoes to carry out excavation, traditionally carried out by hand labor. Use of concrete mixers will help to improve concrete quality, by producing a more uniform mix. Some of the smaller contractors do not have enough equipment to adequately carry out the work and the labor shortage is creating a problem for them.

The Committee toured the Directorate accompanied by the Director General and staff engineers. A contractor accompanied us, for a portion of the tour. The following are noted:

Site 1: Mislimania canal site near Simbillawein City. A bridge under construction. This structure replaces a worn out timber structure. A two bent 5.0 meter span bridge. The abutments and center pier are constructed. One of the decks is under construction, with concrete being poured. The abutments and pier are plain concrete with brick facing. Bricks are used as forming for plain concrete.

The plain concrete structures, are adequate for bridge foundations. The brick work is acceptable. The concrete in place, has a healthy grey color, indicating adequate cement in the mix. Concrete was being placed on one of the decks. A hand mix and head basket operation. Women were carrying the head baskets and placing the mix in small piles over the reinforcing steel. The mix is acceptable without too much slump. A concrete vibrator was being used to move the mix in and around the reinforcing bars. The engineer or an inspector is on the site during construction operations. The concrete mix and its placement are adequate and properly conducted.

The concrete mixing and placement is acceptable. Good concrete cannot be assured without measurement of the components of the mix along with specified mixing and placement of the mix to reduce voids in the concrete. Quality and strength of concrete can be measured by preparation of specified test cylinders from representative portions of work during the mixing and pouring operations and test broken, to measure the strength of the concrete. This is a well known test procedure to determine if concrete strength specifications are being adhered to. With increasing amounts of concrete work being carried out by the MOI, a facility for testing the materials used in construction concrete irrigation structures will need to be established, especially for big structures. If good

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quality concrete can be assured, a more economical structure could be designed. The first priority to achieving a more economically designed structure is to assure quality of the construction materials. It would then be possible to refine the designs. To start getting a "handle" on this process, it is recommended that the consultant carry a concrete impact test hammer to the work sites to help determine the existing strength of concrete. Such recommendations do not apply to small structures.

The only problem noted at the bridge site, is that a concrete mixer is needed. The engineer at the site stated there are no problems, other than those noted above. The site engineer has a BSC from Alexandria University in 1976.

Site 2: Diew bridge on the Boheya Canal, km. 31, almost completed. A three bent 3 meter span structure. The original brick faced, plain concrete abutments and abutment walls and piers are adequate to support the new reinforced decking and rail. The old brick arch deck were removed and the new reinforced concrete decking and rail and walk way constructed. The old bridge was 3 meters wide, the new bridge is 6.0 meters wide. The concrete is acceptable quality The old bridge was 3 ton capacity, now it is 20 ton capacity.

Site 3: Kamoni Bridge, km. 6.1 on the canal Kamoni. A bridge and small intake structure on a branch canal called Hododa, consisting of a small reinforced concrete, pipe and steel sluice gate structure. The intake structure is brick masonary construction. The work is acceptable. The concrete work was completed three days ago. The timber forming still in place, will be removed in 21 days. The small steel sluice gates like this one are manufactured in Mansora. The larger gates, more than two meters wide, are called Fahmy Hen en type and are manufactured in MOI workshops in Cairo.

Site 4: Head regulator on Elshon el Sofla Canal at km. 6.5.. The opening is two meters wide gate completed except for the gate installatio. This Fahmy Henen type gate is raised and lowered by a high reduction gear works. A pair of slots are left in the intake walls. When the gate is installed, timber stop logs will be installed up-stream in the slots to block off the water for maintenance. The gate will be installed in the second set of slots.

There are a few honey combs in the concrete. Overall, the work is acceptable.

Site 5: East Dakahlia inspectorate. There are 11 centers or districts with an engineer and support staff at each center. The intake structures and bridges observed are in the Simbillaweyem District.

Site 6: Intake of the El Khasendar Canal branch canal taking off the El Mansorah Canal. The intake structure consists of a reinforced concrete box section, two by two meters and 40 meters long leading into the branch canal, passing under a high-way and designed to carry heavy truck highway traffic. The gate is Fahmy Henen type, two meters width. This structure was constructed by another contractor. Water level measuring gauges have been installed on the head-walls up and down-stream. The old structure bed level was too high and too small and there was difficulty in delivering an adequate irrigation supply to the canal. There are 4,000 feddans under this command. The structure is acceptable.

Site 7: Intake structure on the Temate Canal km. 6.5, the intake is called Abasia Intake. Width is 2.5 meters. A slide gate, Fahmy Henen type is under fabrication at the central workshops. The customary two slots are constructed to permit gate installation. Water level measuring gauges will be installed both up and down-stream in the walls of the regulator. The job is acceptable and looks good.

In the evening, we reviewed the plans and specifications of structures being implemented in the SR program. The plans and specifications are sufficient detail to permit contracting.

The MOI Directorate staff plans and details the design of the structures. The materials are estimated from the design and the tendering is based on these quantities. The contractor is paid on the basis of the measured amount of materials in place. The engineer directly supervising the work, certifies completion according to the plans and specifications. This is followed by certification of completion by the inspector who must see the work completed. Then the Assistant Director General, and the Director General complete the certification.

Many of the designs are standard. For example, bridges have standard span plans for structures up to eight meter spans. This is a customary practice where there are a number of repetative similar structures.

SECTION 2

FIELD NOTES

West El Dakahlia Directorate, Mansorah
Field Appraisal of the Structural Replacement (SR) Program

May 25-26; The Committee travelled with and/or met: Abdel Magied Badran, Director General; Ibrahim Yusry, Belkas District; and other central staff and a number of field site engineers.

At the office of the Director General, the following are noted:

The SR structural program irrigation work is planned and designed by Directorate MOI staff. The structural work is carried out by contractors. There are adequate engineers, technicians and inspectors to carry out the SR program. No staff shortage exists. No problems are anticipated in adequately monitoring the contractors to assure compliance with the specifications, and contract documents.

From October to the end of the year, contractors can make good progress, as the water is turned out for a portion of the time, and the crop water requirements are lower. From now, rice growing will start and canals are full of water and the water demands are higher, delivery rotations are 4 days on and 4 days off. This hinders construction progress in the canals. There are no other difficulties in project implementation. There are delays in getting deliveries of the Fahmy Henen gates. These gates are manufactured in the government MOI shops in Cairo.

The Group collected the numbers and costs of structures both completed and planned to be able to determine the rate of progress of the SR program.

The MOI is encouraging the contractors to employ mechanical mixers in the concrete operations. This will help to improve the quality of the concrete mix. No concrete testing is conducted. The quality is assured by a pre-designed mix and following specified mixing procedures. Good, durable concrete can be obtained in this manner. The District is urging the contractors to utilize mechanical mixing. This step is in the right direction to helping to improve quality of concrete. The aggregate is sieved, graded, and washed. The sand is clean. The mix will be adequate. These steps are being taken according to the specifications. There are no cash flow problems in financing the works.

The Directorate is divided into seven districts with a total of 25 engineers and support staff including staff engineers covering the work in the Districts. There are 12 contractors able to carry out the work.

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Site 1: Recently completed bridge on the Bashawat Canal in Belkas City. The old bridge was broken down and obstructing the water flow and too small. The obstructing material was removed. The new 8 meter span was constructed.

The concrete work, is acceptable. The concrete showed evidence that it had been vibrated. Next season, mechanical mixing of the concrete will be carried out. This will improve concrete quality. The bridge is designed for 70 ton loading.

The Directorate is composed of four districts. The district engineer was present and explained the essentials of the bridge.

Site 2: Bridge and check structure on the Shawamill Canal. This is a large canal and the contractor can work only during the period of canal closure. The rotation is 4 days closed and 4 days opened. This is a large bridge under construction, the right bank abutment and the center pier are constructed. The left abutment has a temporary earth protective bund around the abutment works which will be dewatered during the period of closure, so the foundation work may proceed. The plain concrete inside the brick forming is acceptable. The pier and abutment will be capped with plain concrete and a reinforced concrete deck constructed. The spans are 8 meters each and 6 meters wide. The engineer at the site explained that the main problem was the off and on water situation, which retards the construction activities, but this was considered in the program. The concrete aggregate is acceptable and will be washed and the larger sized rock removed by sieving, when deck construction is initiated. The sand is sharp, clean and adequate for concrete mix.

Site 3: Head gate intake regulator being remodelled to increase the water flow. A Zaafaran head regulator. Another intake channel is being constructed adjacent and parallel to the older structure. The added channel regulator will permit about double the present stream flow, permitting additional area of land to be served irrigation water. The Fahmy Henen type gate will be installed in the new second intake. The channel ways are four meters wide and the new channel three meters wide and will be bridged by a six meter wide reinforced concrete bridge, 30 ton capacity. The concrete and brick masonary work is acceptable quality. The old bridge, in poor condition, will be removed and replaced with new reinforced concrete decking. The original structure was constructed in 1939 and the three meter wide enlargement will enable the canal to serve irrigation water to a much larger area. The old intake was in good condition and only needed new bridge decking. The left wall of the new intake is the outside right wall of the old intake. The structure is 44 years old, the brick work originally backed by earth looks good and will only need plastering to produce a suitable left wall for the new intake channel.

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Site 4: Small intake called Canal El Fasel El Solfa from the Malha Canal. The entire old structure had been removed and a new 2.0 meter width intake gate constructed. A Fahmy Henen type gate will be installed. The engineer in charge explained that a three meter wide foot path reinforced deck will be constructed. The work is acceptable quality. This job looks good. The gate is being manufactured in Mansora City and is expected to arrive at the site in about one month. It was noted that the stone pitching at the outlet of the intake was cracked and settled. This is the result of inadequate compaction of the earth foundation under the stone pitching. The damaged stone pitching will be removed and rebuilt.

Site 5: Balamony Canal Bridge km. 33.6 and two six meter spans with one meter foot path on each edge of roadway. This bridge is a very good looking bridge. One of the best jobs observed. Two other bridges on this canal had been similarily well constructed.

(λ')

SECTION 3

FIELD NOTES

El Sharkia Directorate, Zagazig
Field Appraisal of the Structural Replacement (SR) Program

May 29-30; In the Directorate Office the Committee met and/or travelled with Ali Abdel Rahman, Undersecretary, Ministry of Irrigation; Engineer Talaat Ishak Tadros, Director General Irrigation Department; Engineer Mohamed Khalil Eltoukhy; and a number of District engineers at the field sites.

In the Under-Secretary's office the following are noted:

There are no significant problems in administering the SR program. There are adequate contractors to carry out the work. Staff engineers adequately supervise the job sites. The jobs are grouped so that one contractor will contract for a group of SR activities. An engineer will be assigned full time to the contractor's SR activity, for monitoring and inspection control. All work has been tendered and will be completed by end of December 1983.

At the job sites the following are noted:

Site 1: Gate control regulator structure on the Kanyat Canal about km. 5.0 from the intake. The old regulator is still in place. It is in very poor condition and the bridge over the intake channel will not support vehiclular traffic. The new regulator is located immediately down-stream. A Fahmy Henen type gate is setting loosely in the slots and will be installed by the contractor. The job is acceptable. A plain concrete cap will be constructed on the abutments. A reinforced concrete 2.5 meter span bridge, 6 meter wide and 30 ton loading will be constructed. Stone pitching has been has been constructed for about 10 meters both up and down-stream from the gate to help prevent bank erosion. The job is acceptable. The Directorate is experiencing no delays in deliveries of these gates.

A troublesome aspect of the program, although not a significant problem, is the large number of relatively small units to be constructed. As mentioned previously the units are grouped for improved contracting management.

Site 2: The bridge 5.8 km. on the Messalameya Canal, 30 ton capacity, two spans 5 meter each, 6 meter width. Under construction, the abutments and center pier are constructed. The natural brick facing is good and workman like; the job is

acceptable. All the irrigation brick-work is left in natural condition and will be pointed up. The old steel span bridge, was too narrow for vehicular traffic and will be removed when the new bridge deck is constructed. The AID shield carved and colored in marble is in place on the wing abutment. Stone pitching up and down-stream is acceptable. The plain concrete cap is constructed on the abutment and center pier.

On the way to the next site we passed several bridges on this canal. All abutments are acceptable. The abutments are constructed and caped and are awaiting the construction of the reinforced concrete decking, rails and sidewalks. The contractor is carrying out a contract for eleven bridges in this group. The work is planned so that he will construct the decks in successive order.

Site 3: A bridge under construction, the AID shield is in place on the wing abutment. The forming is in place for supporting the reinforcing steel. The deck span is 4 meters, 6 meters wide, 30 ton capacity, on Bany Amer Canal. All the bridges on this canal are identical, with a standard design. The stone pitching is constructed up and down-stream and is acceptable. The concrete form work is very good and acceptable. The gravel stacked at the site is not graded. This gravel was used for plain concrete. Smaller size 3/4" minus gravel will be brought in for construction of the deck. Vibration machines will be utilized to move the concrete among the reinforcing steel. Concrete mixing and placing is a hand mix and head basket operation. A contractor at this site stated he had 13 bridges under contract.

Site 4: A small screw type steel slide gate head regulator on the Gezira Canal, 14 km. The work is especially constructed with a pipe under the railway road bed. This is a good and acceptable gate works. The intake is a concrete pipe with a gate one meter by three meter and the intake is a concrete pipe 11 meter long. The stone pitching is good and is acceptable both up and down-stream on the main canal.

Site 5: A head regulator, the same size as site 4. These were old meskas that were replaced by new intakes. The works are acceptable.

Site 6: These are seven aqueducts crossing the Eleim Drain. The pipe is 30 cm. dia spiral steel welded pipe, 15 meters long. Stone pitching is constructed at both ends of the pipe. The job is good and acceptable. The steel aqueducts are supported at the ends by round steel pipe supports set in concrete foundations.

Site 7: A small slide gate head regulator was observed in passing on the opposite side of the Gezira Canal. The contractor was constructing the concrete cap on the structure.

Site 8: Tail escape gate structure at the end of the Set Oyon Canal constructed as a morning glory hole intake, which maintains a uniform water level at the tail of the canal. The gate may be opened if necessary, to drain the canal. The morning glory hole is one meter in diameter and water is conveyed by a 50 cm diameter concrete pipe 15 meters long leading to the main drain. Stone pitching is extended up-stream about 10 meters from the morning glory overflow. Stone pitching is constructed both up and down-stream from the outlet of the tail escape. The concrete work is a bit sloppy appearing but is acceptable quality. The brick work is good.

The group returned to headquarters in Zagazig, where detailed plans and specifications were reviewed. The structures are generally standard design. The engineer will design and detail a structure and tracer draftsman will complete the drawing. The plans are acceptably drawn and detailed enough for the contractor's engineer and construction control. The bar bend schedule is shown in sufficient detail so the reinforcing steel may be cut and bent on the construction site.

SECTION 4

FIELD NOTES

El Ismailia Directorate
Field Appraisal of the Structural Replacement (SR) Program

May 30-31; We met and/or were accompanied by: Eng. Mohamed Abdel Halim, Undersecretary, MOI; Engineer Ibrahim Zaki Mohamed, Director General; Engineer Abdel Wahab Mohamed Kinawi Aziz Habib, Inspector of Irrigation, Ismailia District; and a number of field engineers at the construction site.

Site 1: At the District Office we were given the statistical data for the SR Program. No special problems are being experienced with the program. No staffing problems. Adequate staff to carry out the work. There are six contractors in the directorate and are enough to carry out the SR program.

Site 2: Km. 0.7 Bahar El Ramla Canal, a main canal in the District. All the structures on this canal were remodelled or replaced. The main regulator is two vents 2.5 meters wide each, with Fahmy Henen type gates, . The gates are on the site. They were manufactured at Zagazig. Workmen of a special contractor are installing the cast forged slides for the gates. Also there are two side inlets, steel sluice screw one meter wide to serve small farms near the main intake regulator. The gates serve two smaller canals called Fam Ayub and El Masa Canal.

The concrete work is acceptable. The brick work is good. The stone pitching both up and down-stream is good and acceptable, water level gages are installed both up and down-stream. The Bahr Rl Raml Canal was closed yesterday so the gates could be installed. They will be installed within five days. The forgings for the slide gates are lined up very well. The bridge across the intake main channel is 6 meter width two - three meter span 30 ton capacity. The side bridges over the smaller side canals are one meter span 6 meters wide and 20 ton capacity. Additionally there is a small Meska steel sluice gate installed on the right intake to serve land owners on the right bank. On this canal there are two additional similar regulators. One gate is identical and the other is a single vent structure at km. 8.0. The gate installation is quite efficient, five days closure is required to install the gates.

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Site 3: Bridge km. 4.0, Bahr El Raml Canal, width 6.0 meters and span is 2 meters and 30 tons capacity. The entire structure was reconstructed. Originally was a very small wood bridge. It was suggested to the Directorate that chamfer strips be used during concrete forming to produce a better appearing rail on the bridge. The concrete is excellent and brick work is good and acceptable. The stone pitching up and down-stream is very good and acceptable. There is clearance between the brick and concrete work to provide for expansion. This is a good construction practice. Concrete vibrators were used in placement of the concrete in the decking, beams and raits. Cost of brick work is about LE 50/M and also for plain concrete work and LE 170.000/M for reinforced concrete.

Site 4: Small intake structures were observed under construction on the left bank of the Port Said Canal. The brick work is good. We stopped at a larger left bank intake steel sluice gate which represents 600 similar structures on this canal, km. 13.0 Port Said Canal, left bank steel sluice gate to control the water to the field. They are opened for four days and closed for four days. Size varies from 30 cm. to 60 cm. diameter pipe size. The pipe at this site is 60 cm. The stone pitching up-stream and leading to the cross canal regulator is good and acceptable. These are steel slide sluice gates to control the water. This gate is small, very bulky and sturdy and very functional. The stone pitching will be completed to connect up with the stone pitching from the main gate regulator.

Site 5: Km. 14.0 Port Said Canal. Another slide steel sluice gate structure. About the same size vent (as seen at km. 13.0) 60 cm. diameter pipe, and steel gate to control the water. It is especially noted that the stone pitching at the outlet of the gate was constructed to protect the trees growing near the bank. Environmental consideration.

Site 6: Bridge km. 1.0 on the El Shagra Canal. The bridge is skewed to cross the canal and maintain a straight road alignment. The deck is completed, the rails are yet to be formed and poured. The rebar is well placed and straight. The bridge will be completed in about one month. Span 2 meters 70 ton capacity, 6 meter width plus two side walks. The aggregate and sand at the site is good, well graded and clean. Excellent quality and washed. There is considerable stone pitching, as the bridge is skewed which requires more length of pitching. It is also skewed to adequately protect the banks. The concrete and brick work is acceptable and good. There are measuring boxes on the site for properly proportioning the aggregate and sand. The contractor is using mechanical mixers. There are two other similar bridges on this canal but not skewed. The hand rails are reinforced concrete, because being near the sea the steel must be protected from sea mist to prevent rusting.

At the office the specifications and detailed plans were reviewed. The contractor is required to employ an engineer to assure that the plans are properly executed in the field. The contractor engineer works with the MOI engineer to help assure a specified job. There are 17 engineers in the Directorate, all graduates.

SECTION 5

FIELD NOTES

El Behaira Directorate
Field Appraisal of the Structural Replacement (SR) Program

June 1-2; The Group travelled with and/or met: Ahmed Makram, Undersecretary; Zaghlool Dukrowry, Acting Director General; Abo El Monem Tawfic, Director of Works, Construction; Abd El Malek Salib, Director General of Irrigation Projects; Fayek A. Botros, Director of West Delta, Irrigation Projects; Eng. Ahmed Abdel Moty Abo Alia, Director of Works; and a number of field site engineers.

At the office of the Director General, the following are noted:

The SR structural program is planned and designed by Directorate staff. The field structural work is carried out by contractors. Adequate staff of engineers, technicians and inspectors are at hand to carry out the SR program. No problems are experienced in monitoring the contractors to assure compliance with the specifications and construction procedures. There are 28 engineers on the staff and no shortage is experienced. There are adequate contractors to carry out the work. The contractor is required to also provide an engineer in his employ to assure that the plans and specifications can be followed and carried out. The structures are certified completed by the engineer at the site, second by the District engineer, who must also see the works complete. Third, by the inspector who must see a certain percentage of the works. Thus at least two engineers must personally certify to completion of the work.

We collected a summary of numbers of structures and estimated completion costs from the Directorate records. The works are tendered under contract. According to the contracted agreements, the estimated progress of work will be maintained.

There are no particular problems other than those normally associated with a construction program. The contractors are utilizing more mechanical mixing of concrete and other mechanical aids to construction.

We toured the Directorate accompanied by the Assistant Director General, other senior staff engineers and field site engineers. The following are noted:

Site 1: Diversion intake structure, km. 6.0 on the Denshal El Garby Canal. This was a special intake structure to deliver water from the main El Khandak El Sharky Canal in the Denshal branch canal at km. 6. The Denshal Canal could not be enlarged due to restricted right-of-way between the railroad and the highway. This structure is planned to increase the water flow in two feeder canals below its main intake. The structure is twin box 2 X 2 meter reinforced concrete 30 cm. thick walls passing under the railroad to deliver water to the Denshal feeder canal. The intake structure will be controlled by two Fahmy Henen gates at each end of the box culverts. The area to be served will be about 20,000 feddans; the concrete work is acceptable. The stone pitching at the inlet and outlet to protect the canal banks is acceptable and good work. The stone pitching to protect the canal bank from the outflow is acceptable. The pitching is adequately protecting the bank as there is no observable erosion from the water flow. This relatively large intake structure was completed in three weeks without interrupting the railway traffic. The structure was constructed during the winter closing of the canal of about 25 days. A very nicely synchronised operation, considering that the steel support beams for the railway had to be pulled under the railway by a hand winch method.

Of special interest to us, was a 10 year old Fahmy Henen gate structure in the feeder canal immediately below the cross intake just discussed. This gate, although 10 years ago, is in excellent condition and well maintained. One gets the impression, when observing the sturdiness and the heavy forged slides for these gates operate in, that they will last as long as the pyramids. All the MOI structural work gives the impression of being constructed to last a very prolonged period. On the older structures, the brick work is in excellent condition, the concrete shows some deterioration, light maintenance is only required. The structures are very functional.

Site 2: Intake Aboushady Canal, right bank East Khandak el Sharky, km. 2.0. Reconstruction of an enlargement on intake to increase the delivery capacity 2.0 X 2.0 meter Fahmy Henen gate will be installed. The structure is brick masonary construction. Water level measuring gages will be installed in the up and down-stream head walls. The brick will be left in natural condition. The grooves for the slides for the Fahmy Henen gates were constructed too small for the slides. The workman were widening the grooves in the intake walls to install the forged slide sections on hand at the job site. The old Fahmy Henen Gate, 15 years old is in excellent condition. This gate when removed could

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be used elsewhere and would last another 15 years. The brick work is acceptable. The quality of the brick is not as good as the older brick in the older structure. The engineers are experiencing difficulty in getting good quality brick to put in the structures. The brick masonary walls will be capped by plain concrete. When the gates are installed, the work will be acceptable.

Site 3: Bridge, Aboushady Canal, km. 1.5. A reinforced concrete decking, plain concrete abutments and wing walls faced with brick span 3 meters and 6 meters wide. The rails are reinforced concrete. A 30 ton capacity bridge. All the new bridges on this canal are similarly designed. The concrete work is acceptable but the form work was rough and left the concrete with a rough and uneven appearance. Although the structure is functionally acceptable, more attention to improving the appearance would give a better impression of the quality of the work. The concrete will be plastered to smooth up the job. This would be an unnecessary step if good appearing concrete structure were produced.

Concrete vibrators were utilized to move the concrete in and around the reinforcing steel. There is some honey-comb in the concrete indicating the vibrator accomplished its work in a fair manner. A mixer was utilized to mix the concrete. The materials for the up and down-stream pitching are on the site and will be constructed by the contractor.

Site 4: Bridge about 15 years old, not an AID job. It is a good example of the inadequacy of plastering. The plastering was spalled off in large patches leaving a worse appearance than if no plastering had been applied on the concrete. The rail was slightly damaged and broken along the top rail so that some of the reinforcing steel is exposed. The bridge is quite functional, and light maintenance would produce a good appearing bridge that would serve for another long period.

Site 5: An old head regulator on the Sahilmorkos Canal. Three new Fahmy Henen Gates 3 meters width, 5.75 meters height were installed on this old regulator. A contractor called Kasana Company specializes in installing these gates. The contractor utilizes special cranes to install the gates. This hand regulator is 65 years old and the brickwork is excellent. The department replaced the reinforced concrete bridge decking 8 years ago.

Site 6: Bridge Canal Aslab, km. 1.5. The marble USAID plaque is in place and looks impressive, being cut and colored into a white marble plate. The bridge is 3 meter and 6 meter width one meter side walk on each side 30 ton capacity. All bridges on this canal are similarly constructed. They are being constructed from standard plans. Plain concrete, brick faced abutments and reinforced concrete

deck. The stone pitching up and down-stream is good and acceptable. The concrete work is acceptable. The concrete could be constructed with smoother finish, hereby producing a more cosmetically improved structure. The incoming and outgoing ramps to the bridge remain to be constructed.

Site 7: Bridge km. 2.0 from the intake of the Aslab Canal. A 3 meter span 6 meter wide, 30 ton capacity. The USAID plague is installed. This is a generally good appearing bridge. The concrete fairly smooth, little honey-comb and acceptable. The brick facing on the abutments is acceptable. The stone pitching both up and down-stream is acceptable. A good looking bridge.

The next day we reviewed some of the detailed plans and specifications. Many of the bridges and hydraulic structures are standard plans and the design details for the structure and reinforcing steel are adequate for proper contracting. The plans are satisfactory and is a good job of drafting. They are appropriately reviewed and certified by various levels of staff of the MOI.

APPENDIX IV - A

2019
17-10-1983

10004

ACTION TO	DIR AGR DEPS
ACTION TAKEN	DATE 11/7
NAM	INITIALS

MINISTRY OF IRRIGATION
MINISTER'S OFFICE

Cairo, 17th October 1983

Mr. Michael P. Stone, Director,
U.S. Agency for International
Development,
Cairo - Egypt

Dear Mr. Stone,

I am pleased to let you know that the work under the structural rehabilitation component of the Irrigation Management Systems Project is proceeding on schedule. The outside Engineering Appraisal Report describes what I am pleased to be able to consider a successful program that has already contributed significantly both to reducing the deferred maintenance backlog and to the capability of my Ministry to deal with that problem. The Structural Rehabilitation Work envisaged for the initial two-years will be substantially completed on schedule by January 1984.

I would now like to request the amendment that will provide the funds required to enable us to complete the rehabilitation program, as envisaged in the original project paper which we prepared jointly with your staff and consultants.

At the same time I would like to ask for your favorable consideration of three relatively minor additions to the funds requested for our joint endeavours to improve the irrigation system of Egypt. The first two of these are assistance in phasing the important research program undertaken in the framework of the Egypt Water Use and Management Project into the regular schedule of responsibilities of the Water Research Center of my Ministry and in capitalizing on the experimental experience gained in the area of water management by field testing the results on a sufficiently large-scale to allow identifying necessary details to broaden this work to a national scale together with associated training requirements.

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The last, and in terms of total outlay, relatively minor addition is assistance with the installation of a telemetry system to monitor and eventually control the flows through the entire irrigation system which will lead both to substantial savings in the use of the critical water resource and to its increasingly efficient allocation. My staff have developed superb collegial relations with their colleagues in AID working under the effective direction of the Director of your Agricultural Resources Division, Dr. Fort and his Deputy for Irrigation Projects, Mr. Foster.

We are confident that with your support we shall achieve important results, to the credit of your organization and mine and the greater welfare of the people of Egypt.

Sincerely yours,

M. A. Samaha

Eng. Mo~~hamed~~ Abdel Hadi Samaha
Minister of Irrigation

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UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

CAIRO, EGYPT

October 23, 1983

Excellency:

Thank you for your letter of October 17.

I am pleased that the Structure Replacement Program is on schedule and is fulfilling the purpose of reducing the maintenance backlog. Your staff is to be commended for the excellent job it has done in implementing the first phase of this program. The quarterly expenditure reporting system that has been developed does credit to both the MOI and AID staff, and we look forward to the continuing cooperation between the MOI and AID.

The Amendment to the Irrigation Management Systems Project is being drafted now. It will include funding for the second phase of the Structure Replacement Program, and the three additional activities referred to in your letter are consistent with the purpose of the IMS Project, specifically

1) Extension of research through the Water Research Center

2) Initiation of the Regional Irrigation Improvement Program

3) Installation of a telemetry system.

On behalf of the responsible AID staff I wish to express my confidence that the success experienced thus far in our joint projects will continue to benefit agriculture in Egypt.

Yours sincerely,

P.W. Stone

M.P.W. Stone
Director

His Excellency
Eng. Mohamed Abdel Hadi Samaha
Minister of Irrigation
Ministry of Irrigation
Cairo

AGR/ILD:JHFoster:kgk:10/23/83

Cleared in draft:AD/AGR:REFort

DRAFT
FIRST AMENDMENT
TO
PROJECT AUTHORIZATION

Name of Country: ARAB REPUBLIC of Egypt

Name of Project: Irrigation Management Systems

Number of Project: 263-0132

1. Pursuant to Section 532 of the Foreign Assistance Act of 1961, the Project was authorized on August 27, 1981. I hereby amend that authorization as follows.

   Paragraph 1 is amended by deleting "$42,000,000" and substituting "$139,480,000" therefor.

2. Based upon the justification set forth in the Project Paper Amendment, I hereby determine in accordance with Section 612 (b) of the Foreign Assistance Act of 1961, as amended, 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 amendment; the purposes of the project cannot be met effectively through the expenditure of U.S.-owned local currencies for such activities; and the administrative official approving local cost vouchers may use this determination as the basis for certification as required by Section 612 (b) of the Act.

3. The authorization cited above remains in force excxept as hereby amended.

_____
Administrator

_____
Date

Project Checklist Update

The following updates the project checklist included as Annex VI in the original Project Paper of 1981. All original responses remain valid, with modifications and additions given below. The update has been prepared with reference to FY 82 appropriation sections. However, it reflects guidance in State 325099 for purposes of compliance with the FY 1984 Continuing Resolution.

A. General Criteria for Project

1. FAA Sec. 118 (c) and (d). Does the project comply with the environmental procedures set forth in AID Regulation 16? — Yes

Does the project or program take into consideration the problem of the destruction of tropical forests? — N/A

2. FAA 121 (d). If a sahel project, has a determination been made that the post government has an adequate system for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom?) — N/A

B. Funding Criteria for Project

1. Economic Support Fund Project Criteria

a. FAA Sec. 534. Will ESF funds be used to finance the construction or the operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such use of funds is indispensable to nonproliferation objectives?	No
b. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?	N/A

Annex_____

RECOMMENDATION TO AUTHORIZE PURCHASE OF EGYPTIAN POUNDS WITH U.S. DOLLARS

Over the life of the Project activity contemplated under this amendment, U.S. dollar funds will be used to support local currency costs of the project. Dollar funds will be used for project support costs for Structural Replacement and for local costs of technical assistance.

JUSTIFICATION: Dollar funds used in conjunction with Egyptian pound costs represent an additional real resource to the Egyptian economy and provide means for speedy implementation and offer some incentive for the GOE to implement new initiatives that it might otherwise not be able to undertake. U.S.-owned local currency is fully programmed and is not available for use in this Project. In any event, the use of existing U.S.-owned local currency would add no additional real resources to the economy. Also, given the need of the GOE to restrict the growth in money supply to correspond to the real growth in real resource in the economy, the inflationary impact of using U.S.-owned local currency would have to be offset by reduced GOE disbursements on other programs. Maintaining the fiscal balance is also required under the terms of the current International Monetary Fund (IMF) Standby Agreement with Egypt which the u.S. and other donors have strongly supported.

Appendix IV

2019

17-10-1983

10004

ACTION TO	DIR DAR DEPS
ACTION TAKEN	DATE 11/7
NAM	INITIALS

MINISTRY OF IRRIGATION
MINISTER'S OFFICE

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Mr. Michael P. Stone, Director,
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At the same time I would like to ask for your favorable consideration of three relatively minor additions to the funds requested for our joint endeavours to improve the irrigation system of Egypt. The first two of these are assistance in phasing the important research program undertaken in the framework of the Egypt Water Use and Management Project into the regular schedule of responsibilities of the Water Research Center of my Ministry and in capitalizing on the experimental experience gained in the area of water management by field testing the results on a sufficiently large-scale to allow identifying necessary details to broaden this work to a national scale together with associated training requirements.

The last, and in terms of total outlay, relatively minor addition is assistance with the installation of a telemetry system to monitor and eventually control the flows through the entire irrigation system which will lead both to substantial savings in the use of the critical water resource and to its increasingly efficient allocation. My staff have developed superb collegial relations with their colleagues in AID working under the effective direction of the Director of your Agricultural Resources Division, Dr. Fort and his Deputy for Irrigation Projects, Mr. Foster.

We are confident that with your support we shall achieve important results, to the credit of your organization and mine and the greater welfare of the people of Egypt.

Sincerely yours,

M. A. Samaha

Eng. Mo~~hamed~~ Abdel Hadi Samaha
Minister of Irrigation

UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

CAIRO, EGYPT

October 23, 1983

Excellency:

Thank you for your letter of October 17.

I am pleased that the Structure Replacement Program is on schedule and is fulfilling the purpose of reducing the maintenance backlog. Your staff is to be commended for the excellent job it has done in implementing the first phase of this program. The quarterly expenditure reporting system that has been developed does credit to both the MOI and AID staff, and we look forward to the continuing cooperation between the MOI and AID.

The Amendment to the Irrigation Management Systems Project is being drafted now. It will include funding for the second phase of the Structure Replacement Program, and the three additional activities referred to in your letter are consistent with the purpose of the IMS Project, specifically

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3) Installation of a telemetry system.

On behalf of the responsible AID staff I wish to express my confidence that the success experienced thus far in our joint projects will continue to benefit agriculture in Egypt.

Yours sincerely,

M. P. W. Stone

M.P.W. Stone
Director

His Excellency
Eng. Mohamed Abdel Hadi Samaha
Minister of Irrigation
Ministry of Irrigation
Cairo

AGR/ILD:JHFoster:kgk:10/23/83

Cleared in draft:AD/AGR:REFort

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MINISTRY OF IRRIGATION
STRUCTURE REPLACEMENT PROJECT
IRRIGATION BUILDING FUM EL-ISMALIA
SHOUBRA EL-MEZALAT
KHALFAWI POST No. 11614

405
3-2-2/24/11/83

وزارة الري
مشروع الاحلال والتجديد
مبنى الري عوارم ترعة الاسماعيلية
شبرا الخلايات . بريد الخلفاوي رقم ١١٦١٤

November 24 , 1983

Mr. John Foster
Office Director
Irrigation & Land Reclamation
USAID
Cairo Center Building
Cairo , Egypt

Dear Mr. Foster,

I would like to inform you that the Directors General of the five Irrigation Directorates in which the Structure Replacement Project is executed, had sent me letters informing me that , as a result of the carrying-out of the Project works , a saving in the water consumption had taken place.

The following is the saving percentage for each Directorate :

Directorate	The percentage of savings in the water consumption	Notes
East Dakahlia	8.1	-
West Dakahlia	7	Expecting another increase in this percentage after installing the gates.
Sharkia	7.8	-
Ismailia	9.3	-
Beheira	9	-

The above percentage values are under check in the Irrigation Sector Head Office in the Ministry of Irrigation.

In addition , the following benefits are achieved :

* Reaching of water to the tail of canals.
* Decreasing the complaints of the farmers.
* Increasing the Irrigation efficiency

With our best regards.

Faithfully Yours

Dr. Adel Abdel Meguid
Project Director SR + O&M

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DRAFT
FIRST AMENDMENT
TO
PROJECT AUTHORIZATION

Name of Country: Arab Republic of Egypt

Name of Project: Irrigation Management Systems

Number of Project: 263-0132

1. Pursuant to Section 532 of the Foreign Assistance Act of 1961, the Project was authorized on August 27, 1981. I hereby amend that authorization as follows.

Paragraph 1 is amended by deleting "$42,000,000" and substituting "$139,480,000" therefor.

2. The authorization cited above remains in force except as hereby amended.

_____

Administrator

_____

Date

Project Checklist Update

The following updates the project checklist included as Annex VI in the original Project Paper of 1981. All original responses remain valid, with modifications and additions given below. The update has been prepared with reference to FY 82 appropriation sections. However, it reflects guidance in State 325099 for purposes of compliance with the FY 1984 Continuing Resolution.

A. General Criteria for Project

1. 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?	No
2. FAA 118 (c) and (d). Does the project comply with the environmental procedures set forth in AID Regulation 16?	Yes
Does the project or program take into consideration the problem of the destruction of tropical forests?	N/A

3. FAA 121 (d). If a sahel project, has a determination been made that the post government has an adequate system for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom?) N/A

B. Funding Criteria for Project

1. Economic Support Fund Project Criteria

a. FAA Sec. 534. Will ESF funds be used to finance the construction or the operation or maintenance of, or the supplying of fuel for, a nuclear facility? No
If so, has the President certified that such use of funds is indispensable to nonproliferation objectives?

b. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made? N/A