

UNCLASSIFIED

AGENCY FOR INTERNATIONAL DEVELOPMENT

WASHINGTON, D.C. 20523

PROJECT PAPER
AMENDMENT #1

EGYPT: Science and Technology
Cooperation (263-0140)

July 7, 1987

UNCLASSIFIED

PROJECT DATA SHEET

1. TRANSACTION CODE

A = Add
 C = Change
 D = Delete

Amendment Number

DOCUMENT CODE

3

2. COUNTRY/ENTITY

Arab Republic of Egypt

4. BUREAU/OFFICE USAID/Egypt

HRDC/S&T Office

3. PROJECT NUMBER

263-0140.1

5. PROJECT TITLE (maximum 60 characters)

Science and Technology Cooperation

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)

MM DD YY
 06 3 09 15

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

A. Initial FY 6 12 B. Quarter 2 C. Final FY 91

8. COSTS (\$000 OR EQUIVALENT \$) = 2, 17

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. I/C	D. Total	F. FX	F. I/C	G. Total
AID Appropriated Total	4000	4040	8040	14700	21300	36000
(Grant)						
(Loan)						
Other U.S.						
1.						
2.						
Host Country					7000	7000
Other Donor(s)						
TOTALS	4000	4040	8040	14700	28300	43000

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
1) SA	750	270		3000		8040		36000	
2)									
3)									
4)									
TOTALS				3000		8040		36000	

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

710 550 860 950 960 970

11. SECONDARY PURPOSE CODE

510

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

A. Code B. Amount R GEN R/H INT2

13. PROJECT PURPOSE (maximum 450 characters)

To contribute to solving priority development problems having socio-economic impact on end-users and to improve S&T capacity in specific problem related technologies.

14. SCHEDULED EVALUATIONS

Interim MM YY MM YY Final MM YY
 09 91 06 94

15. SOURCE/ORIGIN OF GOODS AND SERVICES

000 911 Local Other (Specify)

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

USAID/Egypt Controller concurs with the proposed methods of implementation and funding.

William A. Miller
 William A. Miller, Controller

17. APPROVED BY

Signature
 Arthur Handly
 Acting Mission Director

Date Signed
 MM DD YY
 07 17 87

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

MM DD YY

FIRST AMENDMENT
~~TO~~
PROJECT AUTHORIZATION

Name of Country: Arab Republic
of Egypt

Name of Project: Science and
Technology for
Development

Number of Project: 263-0140

1. Pursuant to Section 531 of the Foreign Assistance Act of 1961, as amended (the "Act"), the Science and Technology for Development Project (the "Project") was authorized on July 30, 1965. Such authorization is hereby amended as follows:

a. Paragraph 1 is amended as follows:

The last sentence thereof is deleted in its entirety and the following sentence is substituted therefor:

"The planned life of the Project is nine years and nine months from the initial date of obligation. The Project will help finance the foreign exchange and local currency costs of goods and services required for the project."

b. Paragraph 2 is amended by adding a new subparagraph (a) to read as follows:

"I hereby authorize the Science and Technology Cooperation (STC) Component, the purpose of which is to redirect Egyptian science and technology (S&T) programs to help solve priority development problems identified as having the greatest effect on end-users, and to build S&T capacities in selected technologies. From the total estimated Phase II obligations, the STC Component shall involve estimated obligations of Thirty-Six Million United States Dollars (\$ 36,000,000)."

c. Paragraph 3b (Conditions Precedent to Disbursement) is amended by adding a new clause (3) to read as follows:

"(3) Additional Disbursements for the Science and Technology Cooperation Component.

(a) Prior to the disbursement of funds, or the issuance by A.I.D. of any commitment documents under the Project Agreement, to finance the three research programs (national, regional/local, and advanced technology), the Cooperating Country shall, except as A.I.D. may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D.

i. Evidence that all appropriate procedures necessary for governing the administration of project funds for the Science and Technology Cooperation (STC) Component, including the payment of incentives, have been formulated by the Cooperating Country in consultation with A.I.D.; and

~~ii. Evidence that the Project Secretariat has formulated financial, contractual and procurement arrangements for the procurement of commodities and services for the STC Component.~~

~~(b) Prior to the disbursement of funds, or the issuance by A.I.D. of any commitment documents under the Project Agreement, to finance research, development and engineering subprojects for additional problem categories, the Cooperating Country, shall, except as A.I.D. may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D.:~~

i. Evidence that each such problem category meets the selection criteria set forth in the Component Description; and

ii. Evidence that a budget for such problem category, which includes, among other things, cost breakdown and disbursement projections over the life of each activity in the problem category, has been prepared.

(c) Prior to the disbursement of the third scheduled incremental obligation of funds for the STC Component (as contemplated in the Project Paper), or the issuance of any commitment documents under the Project Agreement for such funds, the Cooperating Country shall, except as A.I.D. may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D.:

i. Evidence that the Egyptian National Scientific and Technical Information Network (ESTINET) has received an allocation of funds in the annual GOE budget for its management and operation."

(d) Paragraph 3 is amended by adding a new subparagraph "d" to read as follows:

"d. Additional Covenants for STC Component.

(1) The Cooperating Country shall provide, on a timely basis, all local logistic support as may be required to ensure effective use of goods and services financed by the Grant.

(2) The Cooperating Country shall ensure that the Steering Committee and the Project Secretariat meet formally with the A.I.D. project officer, at least semi-annually, to discuss major elements of progress in the STC Component.

(3) The Cooperating Country shall ensure that the research organizations, ministries, governorates and universities involved in the STC Component provide to the Project Secretariat and ESTINET all necessary scientific and technical information and non-technical reports for the creation and computerization of appropriate data bases.

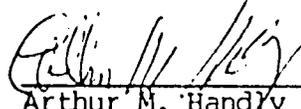
~~(4) The Cooperating Country shall provide to A.I.D. information~~
concerning its counterpart contribution (in accordance with requirements
that will be more fully specified in Project Implementation Letters)
upon request."

e. A new paragraph 4 is added to read as follows:

"Approval of Salary Supplements.

4. The payment of salary supplements, such as incentives, honoraria,
per diem, bonuses and other similar payments, to employees of the
Cooperating Country, in accordance with AID/W and Mission policy
guidance, is hereby approved. The required justification and
implementation plan for any salary supplement arrangement in any
component shall be set forth in detail in the document pursuant to which
such component is approved. The implementation plan agreed to by the
Mission shall be set forth in a Project Implementation Letter."

2. Except as hereby amended, the authorization dated July 30, 1985 remains in
full force and effect.



Arthur M. Handly
Acting Director

7/7/87

Date

Clearances:

A-OD/HDRC/S&T, E. Peterson norm
A-AD/HRDC, J. Sarn [Signature]
AD/PPP, J. Conly [Signature]
FM, D.Shannon [Signature]

d

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ACTION: AID-6 INFO: DCM ECON /B

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ACTION TO	HRDC DPPE
ACTION TAKEN	DATE 7/7
VIA	INITIALS

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E.O. 12356: N/A

TAGS:

SUBJECT: CONGRESSSIONAL NOTIFICATION FOR ST FOR
DEVELOPMENT PROJECT, 263-0140

REF: CAIRO 16211

1. CONGRATULATIONS ON HAVING SUBJECT PROJECT APPROVED.

2. CN WAS SENT TO THE HILL ON JUNE 12. OBLIGATION MAY
BE INCURRED ON JUNE 27. SHULTZ

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#7792

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from Jack Minors

HRDC ACTION FOR:	SET
DATE REC:	30 JUN

PROJECT PAPER

SCIENCE AND TECHNOLOGY COOPERATION
(263-0140.1)
Egypt

X

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ACRONYMS AND ABBREVIATIONS

AID	Agency for International Development
ASRT	(Egyptian) Academy of Scientific Research and Technology
CAD	Computer Assisted Design
CAM	Computer Assisted Manufacturing
CDSS	Country Development Strategy Statement
CP	Conditions Precedent
D&E	Development and Engineering
DRTPC	Development Research and Technological Planning Center
ENSTINET	Egyptian National Scientific & Technical Information Network
EOP	End of Project
ESF	Economic Support Fund
FRCU	Foreign Relations Coordination Unit
FX	Foreign Exchange
FY	Fiscal Year
GOE	Government of the Arab Republic of Egypt
HB	(AID) Handbook
HRDC/ST	Human Resource Development, Office of Science and Technology
HRDC/TNG	Human Resource Development & Cooperation, Office of Training
IFB	Invitation for Bid
IQC	Indefinite Quantity Contractor
IRC	Import Rationalization Committee
IRR	Internal Rate of Return
L/COM	Letter of Commitment
LC	Local Currency
LOP	Life of Project
MARIC	Public Sector Mining and Refractory Industries
MIS	Management Information System
MPIC	Ministry for Planning and International Cooperation
NRC	National Research Center
PACD	Project Assistance Completion Date
PIL	Project Implementation Letter
PIO/P	Project Implementation Order for Participants
PIO/T	Project Implementation Order for Technical Assistance
PP	Project Paper
Pro Ag	Project Agreement
PSA	Procurement Services Agent
PSC	Personal Service Contractor
RD&E	Research, Development, and Engineering
RFP	Request for Proposal
RFQ	Request for Quotation

I. PROJECT RECOMMENDATIONS AND SUMMARY

A. Recommendations:

The Project Committee recommends that an Economic Support Fund (ESF) grant of \$36.0 million be authorized for the Science and Technology-Cooperation (STC) component (the project) of the Science and Technology For Development Project. This eight year project should be incrementally funded as follows:

FY 87 - \$8.04 million
FY 89 - \$12.00 million
FY 90 - \$5.96 million
FY 91 - \$10.00 million

B. Host Country Contributions:

The Government of the United Arab Republic of Egypt (GOE) contributions, in cash and in kind, are expected to be equivalent to \$6.63 million* (L.E. 14.4 million) over the life of project (LOP). Contributions from private industry in cash and/or in kind will support specific RD&E projects. The value of these contributions is difficult to establish, but a provisional figure of \$0.37 million (L.E. 0.8 million) is assumed. Thus, the host country contribution may total \$7.0 million (L.E. 15.2 million) towards life of project (LOP) costs of \$43.0 million.

C. Summary Project Description:

1. Introduction:

The STC is one of five components in the Science and Technology for Development Project (263-0140).

In a decade of GOE/USAID cooperation in redeveloping Egypt's science and technology (S&T) capacity, substantial strengths and capabilities have been added, as have advances in organization and coordination. However, the S&T community still needs new approaches and mechanisms if existing scientific competence is to contribute more effectively to solving development problems. These problems fall into three categories:

*The conversion rate of U.S. dollars at \$1=LE2.17 is only made for presentation purposes and does not imply "maintenance of value" if the fee of the project.

- a. those affecting the economy or social infrastructure nationwide;
- b. those with direct effect at the regional or local governorate level; and
- c. the need to apply advanced technology for future agricultural and industrial development.

2. Goal and Purpose:

The goal of the S&T Cooperation project is to improve the productivity and welfare of the Egyptian people by applying technology to specific development problems. The purpose is to redirect Egyptian S&T programs to help solve priority development problems identified as having greatest impact on end users and to build S&T capacities in selected technologies.

3. SIC Elements:

To achieve its purposes, the S&T Cooperation project will fund a competitive grant program for research in predefined high priority categories. The grants will be open to Egyptian universities, research centers, and private sector firms. This grant program will fund research, development, and engineering (RD&E) and is divided into three categories:

- a. The National Research Program (NRP) subgrant will focus on solving limited, but well defined, national technological problems. Three specific problem areas were identified as having the highest priority, (Other problem areas meeting specific criteria will be defined during the life of the project). These are:
 - Construction materials
 - Industrial Minerals and Chemicals
 - Soil improvement

Approximately \$10.2 million, including funds for commodities and training, will be allocated to this program.

- b. The Local/Regional Problems Research (LRP) subgrant will allocate funds for solving local/rural development problems identified by and associated with specific governorates or regions. Three categories were originally selected:
 - Lake ecosystems
 - Water and wastewater treatment:
 - Small scale industry.

A total of \$8.25 million, including training and commodities, is allocated to this program.

c. The Advanced Technology Problems (ATP) will be a national effort highly selective and designed to build on advanced technology applications. Two frontier applications have been selected:

Biotechnology will be directed initially to techniques relevant to crops for semi-arid lands.

- Computer-Based Technology will be directed to process control for increasing industrial productivity.

A total of \$6.0 million is allocated for biotechnology, and \$4.57 million for computer based technology.

4. Egyptian Management Services:

In order to manage this project, a Steering Committee and Project Secretariat will be created by the Ministry of Scientific Research as a "Special Unit" within the Academy of Scientific Research and Technology (ASRT). The Steering Committee will have policy and oversight functions. The project secretariat will be responsible for day-to-day management of the project, including grant review and approval, administrative support and monitoring.

5. Technical Support Services:

A U.S. management systems contractor will assist the Steering Committee and Project Secretariat in developing the first 18 months' activities. The contractor will also provide short-term consultants for various aspects of the STC project's management and operations.

USAID/Cairo will also retain funds to contract U.S. consultants to assist in preparing special policy studies for this project with the GOE and the S&T community for ensuring that practical priority problems continue to be identified, defined and addressed, and for monitoring and evaluating project progress. Two IQC's will be used for two external evaluations and the project's audit.

The total budgeted cost for technical support services is \$1.83 million.

D. Funding:

Table I.1 summarizes the STC project costs by element and funding source.

E. Analyses - Summary findings:

The Project Committee has reviewed and discussed the STC project in detail.

The project is considered economically, administratively, and technically feasible, socially sound and without negative environmental effect. The cost estimates are reasonable and the project meets all applicable statutory criteria.

F. Waivers:

USAID/DIR is requested to waive:

1. Mission Order 3-10 to permit the payment of incentives to GOE employees of the Steering Committee and Project Secretariat.
2. The restriction of unit price limit of \$5,000 and of the required \$250,000 limit of the total estimated commodity element for shelf items regardless of source/origin for code 899 (free world countries).
3. Formal competitive procedures to permit use of informal competitive procedures set forth in Handbook 11, Chapter 3.
4. The advertisement in the AID Procurement Bulletin for all procurements estimated not to exceed \$100,000.

Figure 1-1: Component Costs by Activities and Funding Source (\$1000)

	AID Grant			Host Country			
		LC	Total	BOE in kind LE	SOE in cash LE	Private-Public Sector LE	IDL LE
1. National Research Program Subgrant							
- Research Contract	640.00	5,900.00	6,540.00	1,900.00	--	400.00	2,300.00
- Commodities	3,000.00	440.00	3,460.00	1,500.00 *	330.00	--	1,830.00 *
- Participant Training	200.00	--	200.00	60.00	--	--	60.00
- Renovation/facilities	--	--	--	290.00 *	170.00	50.00	510.00
SUBTOTAL	3,840.00	6,360.00	10,200.00	3,750.00	500.00	450.00	4,700.00
2. Local Research Program							
- Research Contract	410.00	6,090.00	6,500.00	2,600.00	--	250.00	2,850.00
- Commodities	1,355.00	195.00	1,550.00	640.00 *	140.00	--	780.00 *
- Participant Training	200.00	--	200.00	22.00	--	--	22.00
- Renovation/facilities	--	--	--	578.00	150.00	--	728.00
SUBTOTAL	1,965.00	6,285.00	8,250.00	3,840.00	290.00	250.00	4,380.00
3. Advanced Technology Program							
A. Biotechnology							
- Research Contract	550.00	2,350.00	2,900.00	1,000.00	--	--	1,000.00
- Commodities	2,520.00	130.00	2,650.00	1,100.00 *	240.00	--	1,340.00 *
- Participant Training	400.00	--	400.00	30.00	--	--	30.00
- Renovation/facilities	--	--	--	270.00	200.00	--	470.00
SUBTOTAL A.	3,470.00	2,480.00	5,950.00	2,400.00	440.00	--	2,840.00
B. Computer based Technology							
- Research Contract	450.00	2,350.00	2,800.00	800.00	--	100.00	900.00
- Commodities	1,335.00	165.00	1,500.00	600.00 *	140.00	--	740.00 *
- Participant Training	250.00	--	250.00	20.00	--	--	20.00
- Renovation/facilities	--	--	--	200.00	180.00	--	380.00
SUBTOTAL B.	2,035.00	2,515.00	4,550.00	1,620.00	320.00	100.00	2,040.00
SUBTOTAL A.+B.	5,505.00	4,995.00	10,500.00	4,020.00	760.00	100.00	4,880.00
4. Egyptian Mgmt Services							
- Project Secretarial	90.00	2,260.00	2,350.00	200.00	--	--	200.00
- Equipment/facilities	--	150.00	150.00	80.00	90.00	--	170.00
SUBTOTAL	90.00	2,410.00	2,500.00	280.00	90.00	--	370.00
5. Information Services (ENSTINET)							
- Technical Services	215.00	455.00	670.00	300.00	100.00	--	400.00
- Information/data base	1,285.00	445.00	1,730.00	--	120.00	--	120.00
- Commodities/ing/renov.	300.00	--	300.00	210.00	140.00	--	350.00
SUBTOTAL	1,800.00	900.00	2,700.00	510.00	360.00	--	870.00
6. Technical Support Services							
- Mgt system contractor	700.00	--	700.00				
- Monitoring sup. services	277.00	223.00	500.00				
- Evaluation & Audit	558.00	92.00	650.00				
SUBTOTAL	1,535.00	315.00	1,850.00				
GRAND TOTAL	14,735.00	21,265.00	36,000.00	12,400.00	2,000.00	800.00	15,200.00

* Includes local installation, services and maintenance, storage, customs clearances and fees

II. PROJECT RATIONALE:

A. Background:

Since the resumption of U.S. technical assistance to Egypt, AID support for Egyptian S&T has progressed through two distinct but interrelated stages of cooperation:

- Stage I (1976-1980) was essentially a large capacity building program aimed at strengthening the research capabilities of individuals and organizations.
- Stage II (1980-1986) continued capacity building of universities and research institutes focusing on the concept of problem solving, and establishing links with the technology users. The main emphasis was still institution building but a wider variety of practical problems was addressed.

The Stage I and II projects are summarized in Annex B.

Despite the many and varied development problems facing Egypt and the steadily increasing capacity of the S&T community, technology is not being effectively used in solving those problems. There is still a wide gap between end-users (the potential consumers of technology), and the suppliers (scientists and research workers). There is limited understanding of the necessary linkages between research, technical development, and engineering as well as the role of socioeconomic and technoeconomic studies ensuring the adoption of research results by addressing matters of public acceptance and financial return. Institutional and procedural barriers restrict cooperative approaches to the complex issues of economic and social development, and academic pursuits for personal advancement inhibit researchers from undertaking the needed applied research.

B. A New S&T Technical Assistance Approach:

STC in Stage III, (1986-1994) builds on the lessons learned and the achievements of Stages I and II and is designed to:

- Focus on a limited number of well-defined development problems for which goals can be identified, relevance of approaches and inputs can be monitored and mechanisms to encourage technology adoption can be made available;
- Involve the end-user in problem definition, the evaluation and testing of technical inputs to problem solutions and in ways to implement solutions. These measures require a commitment of time and, to the degree possible, resources of the end-user to help to ensure active participation;

- Encourage and reward interdisciplinary, collaborative efforts to help solve national, regional and local problems;
- Support the analysis of social and economic factors important to the acceptance, adoption and spread of technological inputs for productivity and quality-of-life improvements;
- Assist regional universities and research institutions in undertaking interinstitutional problem solving important to their socioeconomic setting; and
- Establish communication channels to increase the frequency and effectiveness of interchange between researchers and end-users.

The sum of these actions will change, in a significant and lasting manner, the role of S&T in Egyptian development. The need for these changes is evidenced by the expressed desires of the GOE, at the national and local levels, for technical assistance.

C. Rationale:

The rationale for this project is:

If end-users and researchers collaborate in defining problems and identify constraints to be addressed for successful solutions, then resources in support of RD&E will:

- result in cost effective solutions to a larger number of development problems;
- help to attract financing for implementing these solutions;
- increase general understanding of the role of S&T in development; and
- lead to adopting technologies which improve productivity and the quality of life in Egypt.

Evidence of the introduction and role of technology in the socioeconomic development of other countries, notably Korea, Taiwan, and Brazil, supports this rationale.

D. Issues and Comments:

The primary issues raised during project design are briefly presented below. A more detailed description is given in Annex C.

1. Issue: Top GOE officials lack a full appreciation of the need for a strong and effective R&D program.

Comments/

Resolutions: Top GOE officials are willing to support R&D as long as it meets end-user needs and has practical application. The STC addresses this issue. R&D efforts are demand driven and directed towards problems having near-term potential and application.

2. Issue: ASRT must take initiatives to improve the S&T policy framework and coordinate government, academic and public/private sector resources.

Comments/

Resolutions: One element of the STC provides for policy dialogue with a focus on specific policy constraints and alternate means to address them. Furthermore, the composition of the Steering Committee as well as the establishment of a technical liaison office, ensures effective coordination between end-users and research institutions.

3. Issue: The balance between institution building and problem solving research in this project is largely weighted towards the latter. This may hamper the institutionalization of a "system" of S&T research.

Comments/

Resolutions: For the past decade USAID/Cairo invested its major S&T efforts towards institutional development. This has often characterized the achievements obtained from research results, but created skepticism among top GOE officials regarding research payback. Experiences in other developing countries such as Korea suggests that the highest productivity occurs at the adaptation end of the — S&T scale where imported technology can be effectively adapted and applied.

However, the STC project also addresses institutional development in its two main elements; local research programs and biotechnology, where emphasis will be on capacity building and technology transfer as well as solving specific problems.

4. Issue: After the PP development, additional analytical work is still needed to further develop research subprojects in identified problem areas as well as new problem areas. This may extend the time frame to achieve project objectives.

Comments/

Resolutions: The STC has identified initially 11 problem areas to be implemented during the first two-three years of project implementation. STC also includes funding to identify research subprojects using Phase I of the S&T for Development Project signed on March 26, 1986. The STC implementation plan includes a

full year for identifying research subprojects, issuing RFPs and awarding contracts. After this initial effort, the Project Secretariat will be responsible for identifying subprojects on a regular basis.

5. Issues: The organizational arrangement calls for a large degree of coordination among a range of Egyptian institutes with a record of limited success in coordination.

Comments/

Resolutions: A multi-institutional Steering Committee and the Project Secretariat will ensure project coordination at the policy and management levels. Other measures such as seminars and workshops, biannual reviews, informal meetings and a technical liaison office will provide effective project coordination at the operational level.

6. Issues: Limited efforts were made by ASRT and the universities to find out whether research results in previous GOE funded S&T projects were applied and transmitted to industry/agriculture for practical applications.

Comments/

Resolutions: We have resolved this issue at two levels:

1) Human resources' level, by employing technical liaison agents whose functional responsibilities are to bridge the gap between researchers and the end-users in the industrial and agricultural sectors.

2) Technical level, through establishing the Scientific and Technical Information services where information on research in Egypt and in other countries can be retrieved and used.

III. S&T COOPERATION PROJECT DESCRIPTION:

A. Background:

STC is one of the components of the Science and Technology for Development Project which was signed with the GOE on March 31, 1986. The umbrella Project includes other components which are also directed to specific development needs: Productivity (Energy Conservation, Energy Manpower Development and Land Use Planning) and Critical Childhood Disease; Schistosomiasis.

There are a great number of development problems having a direct economic effect on Egypt's growth which require the participation of a large segment of the S&T community for solution. STC addresses scientific and technological inputs to specific problems of national and local priority consistent with the GOE five-year plan and USAID sectoral and subsectoral programs.

B. STC Goal:

The goal of the Science and Technology Cooperation project is to improve the productivity and welfare of the Egyptian people through the application of technology to specific development problems.

Application of S&T to specific development problems can lead to improvement in productivity by providing cost effective solutions to technological problems with high levels of economic and social benefit.

C. STC Purposes and Strategy:

1. STC Purposes:

The purpose of the STC project is to redirect Egyptian S&T programs to help solve priority development problems identified as having greatest impact on end-users and to build S&T capacity in selected technologies.

The STC project will provide technology end-users (industry, national, regional and local authorities) and technology suppliers (universities, research institutes and engineering firms) with experience in defining priority problems, and in carrying out the research, development, engineering and field testing processes required for applying technology to socioeconomic development needs.

This project will have problem solving as a primary objective. Project funds will be used to build on a solid RD&E foundation in support of priority development needs. The research groups will be principally driven by the demand side of RD&E. In the process of carrying out subprojects, research activity will also contribute toward capacity building in the RD&E institution.

2. STC Strategy

This project is the outcome of a lengthy preparation process. The design team visited seven governorates of Egypt to discuss development needs and priorities with regional officials, local university staff, and local industries.* Meetings were also held with research institutes, universities, government agencies, industries, USAID officers, and individual scientists and engineers in the Greater Cairo area. A seminar was held to discuss trends in biotechnology, local skills and problems that could be addressed with greater capacity and coordination. The project design process included review of the Egyptian Five-Year Plan (1982-1987), the S&T Five Year Plan (1982-1987 and 1987-1992), and review of technical and capital assistance activities in USAID local and urban administration and agricultural offices.

As a result of these consultations, the design team concluded that:

- Priorities and problem perceptions in the governorates and in industry differ from those at the national level and in the S&T community.
- Research capabilities vary substantially across universities and research centers. More advanced institutions can address more complex research problems. Less experienced universities or institutions should limit their contributions to the solution of less complicated research problems while strengthening their capabilities.
- Problem areas can be grouped under three specific, selected research categories: National Research, Local Research, and Advanced Technology Programs. Subgrants will be allocated for these areas with the common objective of focusing on economically important problem areas in which research can be identified and executed and solutions provided. The three elements will be directed to different primary user groups, and each will require a different level of capacity building and development capability.

The implementation strategy for STC will emphasize:

- Selecting priority problem areas in accordance with a set of established criteria developed in the S&T strategy as explained in subsection E.1.b. below;
- Applying specific criteria for competitive research proposal approval and sub-project monitoring;

* Several design team members were also prominent in the USAID/GOE's 1983-84 S&T Assessment.

- Direct involvement of end-users in problem definition, implementation and the testing of research results and matching funds whenever possible;
- Encouraging multi-institutional and interdisciplinary research sub-projects; and
- Compensation scales for researchers competitive with private sector consulting and industrial firms.

D. End of Project Status:

The STC Program Assistance Completion Date (PACD) is September 30, 1995, at which time the following processes and capacity improvements will be completed:

- Technical inputs will have been provided to socioeconomic problems in areas such as lake ecosystem improvement, water and wastewater treatment, industrial minerals and chemicals, construction materials, small-scale industry, soil characterization, and other areas to be identified.
- Interdisciplinary and multi-institutional S&T research directed to national and local development problems is an accepted and adopted approach.
- Benefits from cooperation between end-users and research teams will be seen and linkages institutionalized.
- Social and economic inputs included in developmental research.
- The regional universities are capable of providing technical inputs to solving local and rural problems.
- Selected universities and research institutes are capable of applying advanced technologies to industrial, agricultural and environmental problems.
- The technical liaison activity supported by strong information services, contributing to new and better links between researchers and the productive sectors of the economy and to more appropriate technical solutions for development problems.
- A management information system for the project will be established and used.

E. Project Elements:

The STC imposes significant constraints on the selection of problem areas and on the award mechanism of research subprojects derived from these problem areas. A problem area, by definition, is a broad topic containing a

multiplicity of research projects that could be undertaken to devise an integrated solution to this problem. Approximately 50-60 RD&E projects will be funded under the STC project. It calls for identification of problem areas by end-users, in accordance with specific selection criteria described in section E.2., and the general use of competitive contracting for awarding research subprojects.

1. Description of Project Elements:

The three project elements consist of:

- a) National Research Program
- b) Local Research Program
- c) Advanced Technology Programs

A summary of each of the project elements is discussed below. A detailed description of each of the problem areas is offered in Annex D.

- a. National Research Program (NRP): will be limited to addressing well defined major national problem areas.

The R&D units in the major universities and research centers are better equipped and capable of solving these problems with less capacity building required and more emphasis placed on technology transfer. Three problem areas have been initially identified:

- Construction Materials: Selected because of the growing need to meet current and future increased demand for brick and other types of construction material. It has been estimated that the annual consumption of construction bricks will reach 10 billion by 1990 and 15 billion by the year 2000. The use of agricultural soil for brick making has been banned leading to suspension of many brick manufacturing operations and employment loss for approximately 72,000 workers. Substitute materials other than cement are locally available but require improved technology for proper use.

STC will finance a series of research subprojects, on an interdisciplinary, multi-institutional basis, which include:

- laboratory and pilot plant investigation of raw materials and suitable additives;
- the solution of the technical/engineering problems of brick-making from locally available raw materials;
- designing and testing appropriate artisanal brick manufacturing;
- study of the economics of production and optimum use of available equipment;
- study of human resources needed to establish the most cost effective manufacturing methods.

~~The potential end-users are brick makers, building contractors, local developers and investors and the Ministry of Reconstruction and New Communities.~~

- Industrial Minerals and Chemicals: Egypt currently imports industrial chemicals and minerals for industrial processing; estimated at 294,000 tons per year at a cost of L.E. 160 million. Industrialists agree there are proven reserves of local raw materials that could be exploited for producing industrial chemicals and value-added minerals processing.

RD&E projects will include:

- technical, economic and feasibility studies.
- poor and inconsistent quality of ceramics and clay materials.
- development of kaolin and alum refinement procedures.
- high temperature processing and polymerization of inorganic or organic base materials.
- improving mining and mineral processing technology such as recovery of sodium chloride and calcium chloride and extraction of titanium oxide from ilmenite ores.
- developing new alloys such as aluminum, silicon alloys from aluminium slags.
- pilot or demonstration plant operations and beneficiation studies on industrial minerals.

The potential end-users are both private and public foundries and chemical companies.

- Soil Improvement: A problem area of national concern is the limited arable land base. This problem is aggravated by deteriorating conditions of the land under permanent cultivation and by the high cost of reclaiming new land for cultivation. Soil quality has deteriorated because of rising water tables and increased salinity, associated with permanent irrigation. Bringing new land under cultivation has rarely been cost-effective. Research will focus on cost-effective technology to improve/maintain soil condition and to reclaim land for cultivation.

Research sub-projects will include:

- developing simple technologies that can be used by farmers to lower the water table.
- developing/adapting salt tolerant varieties of crops.
- cost-efficient soil conditioning methods.
- cost-effective crop rotation schemes that help maintain or improve soil fertility.
- irrigation methods for use in areas with severe water shortages.
- minimum/no-tillage methods appropriate for semi-arid conditions.

The potential end-users are the Ministry of Agriculture's extension services, private and public agrobusinesses, and the Ministry of Land Reclamation.

- b. The Local Research Program (LRP): is intended to solve local/rural development problems identified by and associated with governorates or regions. Emphasis will be on capacity building and technology transfer strengthened by linkages with major Egyptian universities or research centers, with the local university as the research leader.

The following problem areas were identified with the assistance of officials of seven governorates (Alexandria, Menoufia, Kafr El Sheik, Suez Canal, Assiut, El Gharbia and Damietta). They were also explained to and discussed with the technical secretariat (Amana) of the Interministerial Local Development Committee which is responsible for program policy and coordination of the AID funded Local Development II project (263-0182):

- Lake Ecosystems Improvement: There are five lakes on Egypt's northern coast: Mariut, Edku, Borollos, Manzala and Bardaweil. There is also a chain of lakes in the Suez Canal waterway of which Eltemsah and Elmorra are the most important. These are saline lakes with economically important fish production or recreational use. Only Bardaweil lake is relatively free of pollution although as a semi-enclosed lagoonal lake system, these inlets require regular maintenance dredging. The governorates in which the lakes of Edku, Borollos, Manzala and Bardaweil are located have expressed concern about declining fish catches, and indicated their desire to increase income from fish production and recreational use.

This research will generate recommendations to the governorates for the best economic use of lake resources; including prioritized steps to slow or halt the most serious forms of pollution and beginning to address, at least partially, the root causes of ecological degradation.

R&D will include ecological investigations, fish catch surveys, alternatives to dumping municipal and industrial wastes, mathematical modelling and land use planning.

The potential end-users will be the governorates and the private and public fishing companies of North Sinai (Bardaweil), Damietta (Manzala), Kafr El Sheik (Borollos), El Beheira (Edku) and Ismailia (El Tensah and El Morrah).

- Water and Wastewater Treatment: The problems of potable water supply and wastewater treatment are closely related. It is estimated that 60% of potable water is currently derived from surface water sources. Population pressures and industrialization are increasing pollution of the surface water system and, in the absence of adequate wastewater

treatment facilities, the focus of pollution is either transferred to downstream communities or to irrigation water distribution system. Groundwater in some areas contains unacceptable levels of iron and manganese while, in other areas, salinity is increasing. However, no systematic research has been conducted to provide solutions to the salinity or presence of chemicals.

Egypt, especially in the governorates, lacks trained research staff with experience to advise on selecting treatment technologies, wastewater treatment plants or secondary uses of treated wastewater. The governorates are seeking advice and assistance from local universities and from research centers in addressing the critical problems of water supply and sanitation in municipalities, villages and rural communities. However, there is little capacity in the local universities to address the sanitation, water and wastewater problems.

Research projects will include:

- chemical, biological and microbiological research, soil engineering and environmental and ecological studies,
- improved thermo-cleaning and storage of water and wastewater,
- land application techniques for disposal of wastewater,
- improving the technical capacity to perform improved plant design and operation, and
- use of drinking water from shallow well supplies as well as use of groundwater as a source of drinking water.

The potential end-users will be private and public water and wastewater contractors, the Suez-Canal Authority, the governorates and local entrepreneurs.

- Small Scale Industry: Small scale industry provides employment and income to a significant percentage of Egypt's rapidly growing population. Workers returning from employment abroad are seeking entrepreneurial outlets for their small amounts of capital rather than return to the farms. The productivity and economic viability of these small enterprises varies but is often marginal. Some small industry groups have unexploited export opportunities. There is no system for technical assistance to small-scale industry through LAD, but its successor, WII, has made progress in creating a positive environment for improving and starting small enterprises.

Small-scale industries have been selected as an area for regional and local development because of the expressed desire by local governorates to increase the productivity of existing enterprises and to expand the base of non-polluting, private industries of small and medium size as well as to enhance employment opportunities.

The primary focus will be on town-and village-based small scale enterprises producing consumer goods, agricultural machinery and other small scale manufacturers for provincial market.

The small scale industry activities such as furniture making will provide assistance with foreign market analysis, production and process design, appropriate technology selection, tooling as well as the socioeconomic impacts of relocation. Other activities such as the process and development of dairy products do not require new techniques, but can be solved by applying technical and managerial knowledge that is already available.

The potential end-users will be the Federation of Egyptian Industries, the manufacturing investors and particularly the local entrepreneurs in Damietta, Port Said and Zagazig.

- c. Advanced Technology Program (ATP): This research program will employ two frontier technologies: Biotechnology and Computer Based Technology (CBT). This will enable Egyptian research scientists to adopt, adapt and discover new applications of these advanced technologies to agricultural and industrial problems.

- Biotechnology:

Two problem areas have been selected initially:

- o Crops for semi arid lands for increasing crop production and providing soil enrichment. The crops suggested for initial study include broad beans (foul), dates and clover (barseem). Each crop was selected for its value and the opportunity for substantial improvements in the short term. Improvements will be developed through nodulation studies and green house cultivation. At an appropriate point (i.e., after sufficient training and facilities improvement) foul may be an ideal crop for application of recombinant DNA techniques for storage protein enhancement.
- o Fermentation technology will concentrate on applying new techniques to: the production of non-conventional animal feeds from agricultural and food processing wastes; and treating industrial wastes to produce valuable by-products and reduce pollution levels.

Subprojects include research on fermentation of agricultural wastes for animal feed, and fermentation of pulp and paper water liquor to yield valuable byproducts such as purified liquor, sugars and alcohols for industrial and pharmaceutical use.

The potential end-users will be the Ministries of Agriculture and Industry.

Computer Based Technology (CBT):

CBT represents the practical application of computers electronic principles for industrial improvement. As Egypt has become more industrialized and output has risen, numerous problems have developed which have evolved to limit productivity. For example, a major constraint in most industries-is an adequate supply of stable power, and in process industries, control of raw material quality, inadequate process centers and large rejection rates for finished products all of which severely limit output.

Computer-based technologies can be developed and applied to counter these problems: computer process control, computerized production management, Computer Assisted Design (CAD) and Computer Assisted Engineering (CAE). Initial focus will be placed on the first two areas while capabilities are built for later applications of CAD/CAE.

Three research areas have been selected initially:

- o Computer process control for improved electric power grid management; developing a decentralized control strategy, models for the network, and development of plans and models for network extensions while maintaining reliability.
- o Improved process controls for food processing and packaging: providing logical sequential controls, improving modular design and operational research for sequential processing.
- o Computerized productive management in textile processing: developing integrated data bases to provide a decision support system on different elements affecting productivity, e.g., production scheduling, inventory, transportation and skilled manpower, and development of process simulation models for integration with the decision support system for key elements in process control.

The potential end-users will be the electrical distribution authorities, and private and public sector firms in the food and textile industries.

2. Selection Criteria:

a. For Defining Problem Areas:

In selecting initial priority problem areas, the design team was governed by the following criteria developed for the Mission's S&T strategy.

- End-user orientation and commitment - A key criterion in selecting target problem areas is the existence of end-user groups, enterprises or organizations capable of identifying particular problems. End-user entities should have the ability and financial and human resources to apply research results. It is also desirable, where possible, to select target problem areas where end-users can make a financial contribution to R&D projects.
- Application-related goals and objectives - Clearly defined application-related goals and objectives must exist within a target problem area. Such goals and objectives should match or have a firm relationship to current GOE priorities as well as industry or trade association priorities. Research within a problem area must have the potential for producing positive economic effect and economic feasibility (i.e. aid in cost-reduction, improved efficiency, expanded employment, or increased export potential).
- Relevance to crucial Egyptian development needs - Problem areas should correspond to crucial sectoral priorities and development needs within the national economy. Numerous information sources should be tapped to yield a more coherent picture of key sectoral development needs and identifying existing areas of institutional strength.
- Consistency with USAID sectoral policies and USAID portfolio in Egypt - Problem areas should be consistent with USAID policies and in areas of infrastructure productivity, human resources, private sector involvement and technology transfer.
- Existence of R&D capabilities - Reasonable capabilities and facilities to perform research, development, design and demonstration work within a research category should already exist in Egyptian institutions to ensure achievement of measurable and significant research results. In addition, a demonstrated organizational commitment to the problem area should also exist.
- Emphasis on interdisciplinary and interinstitutional cooperation - Another factor in selecting problem areas should be the degree to which a particular problem area can support both interdisciplinary and interinstitutional research. Applied research activities involving several institutions in multi-disciplinary work can help to strengthen the R&D management skills of Egypt's S&T community.

There will be continuous interaction with end-users to identify new problem areas, using the above selection criteria. However, prior to defining new problem areas, an assessment will be made for application of existing research results. USAID approval will be required for funding new problem areas, as a condition precedent for disbursement. Once USAID approves a new problem area, subsequent approval of research subprojects in the area will not be required.

b. Selection Criteria to Evaluate Competitive RD&E Proposals:

The following criteria were developed for evaluating the RD&E proposals. These will be further refined and included in the manual that will be prepared and distributed to the end users, universities and research centers for RD&E proposal submission and award.

1) Technical assessment:

- approach being recommended is technically sound,
- technological understanding is at stage where finite input can potentially result in crucial progress,
- principal investigator has demonstrated a clear understanding of the problem, and research already conducted in the subject area and
- principal investigator and collaborators are professionally capable of achieving success, or if a deficiency exists, it is covered by a plan to correct it.

2) Economic assessment:

- approach recommended seems to be the most cost-effective for either short or long-term gains,
- total costs seem satisfactory and reasonable,
- individual cost estimates are realistic, in line with local norms, and
- facilities and equipment are adequate or appropriately budgeted for.

3) Social assessment:

approach as submitted is socially sound.

4) Environmental assessment:

- The scopes of work for proposed research projects include, as appropriate, an evaluation of potential environmental impacts which may result from the application of such technology and a review of appropriate mitigation measures to address potential adverse environmental impacts.

5) End-user Participation:

- RD&E proposals contain a clear plan to effectively involve company/industry or government agency identifying the problem,
- proposals show that users will collaborate or effectively use results,

- company/industry is willing to participate (i.e, personnel assigned) or invest some of its own resources in an RD&E project and
- projects are centered around individuals with proven records of performance.

c) Project Management:

The Project Management System requires a single funding, monitoring and coordinating unit to ensure effective interaction between researchers and end-users. A management system consisting of a Steering Committee and a Project Secretariat at ASRT is proposed (See project management plan in section VI.B). We expect this management system will provide the greatest chance for success in initiating and carrying out this project. We do not perceive this administrative and organizational structure will be continued after the STC is completed. (A full discussion is provided in the administrative analysis in Annex J).

F. Subproject Award Sequence and Mechanism:

Fig. III.1 illustrates the solicitation and award process which provides a structural mechanism for the RD&E subprojects award. Some of these elements are highlighted below.

- Definition of problem areas and RD&E

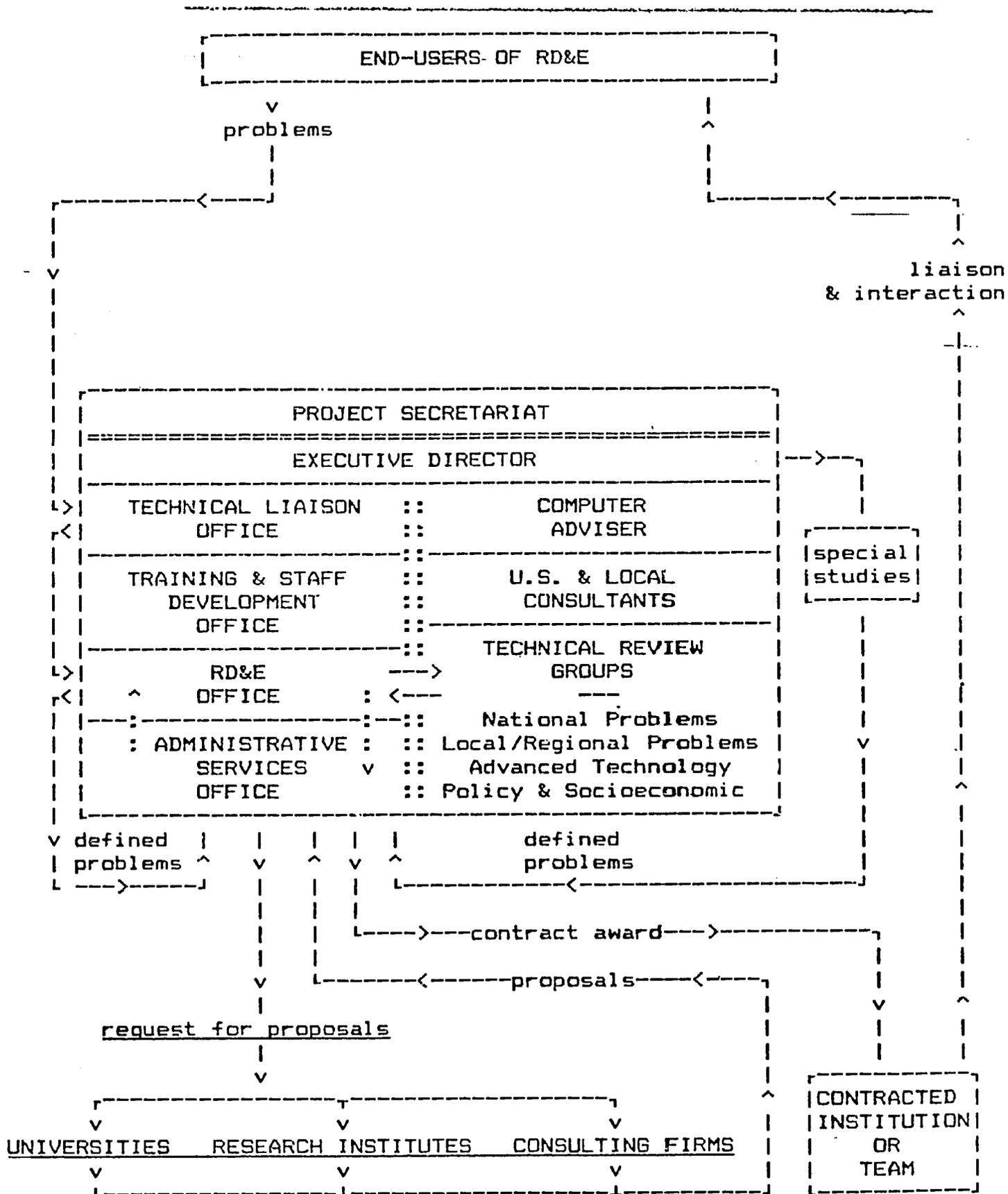
Problem areas are broad by definition, each containing a number of potential RD&E subprojects to develop direct solutions to particular questions. It is estimated that 50-60 RD&E subprojects will be funded under the initial and subsequent problem areas in the three Research Program categories. Problem areas, as described by end-users, may not be expressed in a manner that immediately translates into a RD&E subproject. The Project Secretariat will undertake the detailed definition of problem areas in order to develop RFPs for RD&E subprojects. Detailed problem and subproject definitions must include socioeconomic constraints that proposals should address. The Secretariat will be responsible for assessing problem area priorities and socioeconomic effect to set RD&E subproject funding ceilings, thus assuring proper allocation of STC grants.

- Problem area selection

Problem area selection will be primarily by end-users. The Steering Committee will have a diverse membership including governors, industrialists, and members of the S&T communities. The Project Secretariat includes a Technical Liaison Office with field representation. Project managers and the technical liaison agents from the Project Secretariat's Technical Liaison Offices will contact end-users on a continuing basis, one purpose being problem area identification. Problem areas will be screened by the Project Secretariat with final recommendations made to the Steering Committee for

Figure III

PROBLEM DEFINITION & PROPOSAL SOLICITATION PROCESSES



approval with USAID concurrence. These mechanisms will ensure that new ~~problem areas are of priorities which reflect end-user need and impact; have~~ potential S&T contributions and are consistent with AID policies.

- Proposal solicitation for RD&E subprojects

The procurement of RD&E services will be primarily through competitive Requests for Proposals (RFPs). Draft policies and procedures for proposal solicitation and award will be put in final after the Project Secretariat is functional. This is a condition precedent to disbursement. Explicit designation of end-users and the means for their interaction with the subproject are particularly emphasized as an evaluation criteria and a prerequisite to award. The Project Secretariat may group closely related research projects into a single RFP to use available resources better.

The use of private consultants, U.S. or local, is encouraged to help ensure all aspects of a problem are addressed and the necessary qualified personnel are involved. Proposers will be responsible for identifying appropriate U.S. technical consultants if they are to be involved. Local or participant training may be included in order to strengthen the capacity of the different research groups and end-users.

Each research proposal will be submitted to the Project Secretariat in two envelopes: one containing the technical proposal and the other, the cost proposal. The technical proposal will be evaluated by the technical review committee against criteria set forth in the RFP and offerors will be numerically ranked. A technical competitive range will be established. The cost proposal will then be opened for all offerors that fall within the technically competitive range and a list of order ranked offerors will evolve. The award will then be based on the best offer; price and technical factors included.

A fixed price contract is contemplated, and payment will be made in Egyptian pounds for the research team and in U.S. dollars if a U.S. consultant is subcontracted. A model contract will be prepared by the Project Secretariat and will be submitted to USAID for approval as the financing agent. Once the model contract is approved, AID will not be required to approve contract awards, however, any deviation from the model contract will require AID approval. All financial arrangements will be carried out by the Project Secretariat.

technical review group will consider proposals and make prioritized recommendations for award or for rebid if necessary. The Secretariat's administrative office will separately review the financial soundness of screened proposals and submit its recommendations to the Executive Director who, in concert with the appropriate review group, will make an award for subprojects budgeted at \$250,000 or less. Award recommendations for larger projects will be forwarded to the Steering Committee for its review and approval. Once approved, a research contract will be signed by the Executive Director/end-user groups and the RD&E institution(s).

A management information system (MIS) will be installed in the Project Secretariat to record and track the proposal solicitation process and to monitor PDCE project progress.

Annex E gives a summary of the RD&E award mechanism.

G. Policy Dialogue:

Before and during project design many new contacts were made by USAID and the design team in the science and technology context. Discussions with public and private industrialists, regional university representatives, governmental officials in diverse sectors and Governors of several Governorates provided a broad perspective of the importance and applicability of appropriate technology to problems in daily activities.

It is crucial for USAID and the Steering Committee to enlarge the S&T constituency and maintain a dialogue (especially with governors and local government officials), ensuring that practical priority problems continue to be identified, defined and addressed under the project.

Several mechanisms are suggested for enhancing policy dialogue for this project:

- a) Special Policy Studies: A subcommittee on policies and socioeconomic issues in the Project Secretariat will address specific policy constraints identified in the research program areas. Studies will be commissioned using independent groups in the private sector and universities to provide recommendations for possible solutions. Funds are provided in the Project Secretariat's operating costs to conduct these studies.
- b) Bi-annual review meetings: The Steering Committee and USAID will co-sponsor biannual meetings to discuss specific problem areas and constraints impeding the use of S&T, and issues that require further study. Emphasis will be placed on lessons learned from the different RD&E projects. Funds are available under the USAID Support Services line item for some U.S. technical assistance to prepare specific background policy studies (see VI.C., Procurement Plan). Project funds allocated to the Project Secretariat will be used to cover the operational and administrative costs of these meetings.
- c) Seminars and workshops: The Project Secretariat will sponsor annual seminars and workshops for research groups working in the same problem area. These groups will meet on an informal basis, with end-users and interested S&T groups to discuss research results, exchange views and make recommendations for improving project policies and procedures. These recommendations will be submitted to and followed up by the Project Secretariat.

d) Informal meetings: The Project Secretariat liaison agents, in cooperation with USAID/S&T office, will arrange and organize informal meetings for end users, local government officials and ministry representatives. These meetings will be a forum for dissemination of results, and discussion of new directions, of RD&E needs and possible linkages with activities sponsored by other AID projects or other donors. USAID/S&T has already initiated preliminary informal meetings with the Technical Secretariat (AMANA) of USAID's Local Development Project II (263-0182).

H. AID and GOE inputs:

AID funding consists of a grant of \$36.0 million which will be used to provide the following inputs:

- a. The three Research Program subgrants (national, local/regional, advanced technology) for a total of \$18.74 million.
- b. Commodities for all project elements; a total of \$9.2 million, of which approximately \$1.00 million is for local materials and supplies.
- c. Participant training for a total of \$1.17 million.
- d. The establishment and operation of an Egyptian management services (the Steering Committee, Project Secretariat and technical liaison unit) for \$2.48 million.
- e. Scientific and Technical Information services for \$2.6 million.
- f. Technical support services (including the provision of the U.S. systems contractor) for a total of \$1.25 million.
- g. Evaluation and Audit estimated at \$0.6 million.

Each RD&E project will have the following input element:

- a. Research Contracts which consist of;
 - Technical and administrative service for researchers & support staff.
 - In-country training
 - Local materials and supplies services.
 - Information and documentation services.
 - Other direct costs (travel, conferences, etc.)
- b. U.S. commodities and local materials and supplies.
- c. U.S. participant training.

U.S. experts will be limited to selected short term problem solving, management, setting up the technical liaison office, and serving on technical panel reviews and evaluation. This is consistent with the emphasis of assisting the Egyptian S&T community in solving development problems. Research will be carried out by Egyptians. However, research teams may select appropriate U.S. consultants to assist in aspects of a research project, if necessary.

The GOE contribution will be in-cash and in-kind and is estimated to be L.E. 14.4 million, equivalent to \$6.63 million at the rate of \$1.0=L.E. 2.17* A contribution of L.E. 0.8 million will be provided by end users, private and public sector firms; and governorates and ministries willing to match funds in order to finance part of RD&E projects. The total host country contribution of L.E. 15.2 million will cover the following:

- Office and laboratory facilities and renovation, including standard materials and supplies.
- University and research center overhead and other indirect costs.
- Local costs related to equipment installation, storage, and customs clearance.
- Local costs related to normal project operations.

*Conversion rate of U.S. dollars at \$1= L.E. 2.17 rate is only made for presentation purposes and does not imply 'maintenance of value' if the exchange rate changes during the life of the project.

IV. RELATIONSHIPS WITH OTHER PROGRAMS, POLICIES AND ACTIVITIES:

A. Relationship to the USAID S&T Strategy:

The STC project supports the aim of USAID's S&T strategy of helping the COE to provide solutions to a limited number of major well defined constraints to development. The STC is a cross cutting project helping to focus the Egyptian S&T community on major economic and social needs of the end-users of technology, and contains well defined mechanisms for needs identification, economic feasibility studies and commitments for the application of results.

As a result of previous projects, the Egyptian S&T community now has the necessary capacity to use additional USAID assistance in the new STC project which will retain and build on the strengths and best elements of previous programs, upgrading further Egypt's S&T capacity and improving productivity.

USAID's analysis concludes that focussing on selected local and national problems of socioeconomic value will benefit Egypt in terms of increased productivity, improved sanitation and environment, and better use of material resources.

B. Relationship to the GOE Five-Year Plan:

The GOE Second Five-Year Plan was still in preparation at the time this project Paper was designed. Thus, it is not possible to make a direct comparison of the STC proposed problem areas with the program elements of the Second National Development Plan. However, on February 10, 1986, the AS&T published "A Summary Frame for the Second Five-Year Plan (1987-1992)". This document gives general directions and priorities for the role of the S&T in the national plan and STC priorities relate directly to the summary frame. Of 97 subtopics in the framework, 17 were selected for further analysis and possible inclusion in the STC project.

C. Relationship to other USAID Projects:

The Science and Technology Cooperation project has been formulated to move to a new phase in cooperation with the Egyptian S&T community. This project cross-cuts several sectors and was designed to interact with related sectoral office projects which are applying technology to Egyptian development problems. As recognized in the Mission Science and Technology Strategy Statement, the S&T office will be responsible for keeping this interaction continuous and productive

1. Sectorally Related Projects:

Important examples of the sectoral relationships found in several projects in Local Administration and Development (LAD) provides complementary support for implementing R&D results from the STC. Chief among these is the Local Development II Project (263-0182, \$61 million); formulating and implementing decentralized policies and programs to promote local economic development. Discussions with representatives of this project's technical secretariat ("Amana") and with the LAD Office elicited a strong positive response to the objectives of the STC and the possibility of joint activities to implement STC results through the LDII project.

Other projects which may provide similar interaction are:

- The Development Decentralization Project (263-0161.01, \$26.2 million); training personnel and operating a Local Development Fund for income producing projects.
- The Decentralization Support Fund (263-0161.04, \$50 million); providing budget allocations to 21 rural governorates to purchase equipment for local public utilities, infrastructure and social services.
- The Basic Village Service Project (263-0161.02, \$155 million); strengthening local administrative processes and management capabilities to implement small infrastructure projects.
- The Provincial Cities Development Project (263-0161.02, \$90 million); improving and expanding water and waste water systems to several cities.
- The Sector Development and Support Project (263-0161.06, \$10 million); financing broad sectoral activities in training, systems development and improvement, institutional development and evaluation, and data collection and analysis.
- The Water/Wastewater Sector Institutional Support Project (263-0176, \$15 million); enhancing the institutional capability of the Ministry of Housing and Public Utilities (MHPU) and its executive agency, The National Organization for Water and Sanitary Drainage (NOPWASD), in meeting municipal water and wastewater needs throughout Egypt. An amount of \$100,000 was allocated for research on water and wastewater in addition to a total of \$9.5 million for training and technical assistance in operation and maintenance for the water/wastewater sector employees.

To ensure positive coordination, USAID, under the related activities the S&T Office will ensure coordination through continuing dialogue with the Amana, the LAD and UAD Offices to determine future problem areas under the regional and national categories of the STC.

2..Directly Related Projects.

- Two projects in their final stages, University Linkages (263-0118, \$27.5 million) and the Applied Science and Technology Project (263-0016), \$22.9 million), have played a major role in developing Egypt's S&T capabilities.
- Research management and support systems developed in these projects are incorporated into SIC.

The National Agricultural Research Project (NARP) (263-0152 \$130 million), is a new activity providing equipment, technical assistance, training, commodities and support services to develop the agricultural research community. The SIC project and NARP are being coordinated and will synergize development and application of results in the biotechnology area.

D. Lessons learned from similar AID Projects:

- It is clear from past and existing projects that crucial Egyptian national development problems will require interinstitutional collaboration and interdisciplinary research with selective involvement of U.S. researchers when appropriate and necessary.
- To date, effective transfer of R&D results to practical use has been limited. A gap exists in the definition and focus of problems and in the working relationship between the end-users of technology and the S&T community. A formally established mechanism for interaction and cooperation is required to bridge the gap. The formation of the technical liaison unit and monitoring activities of the project secretariat are designed to meet this need.
- Much R&D, although nominally focused on priority development problems, is carried out as academic research problems. As a consequence, at the completion of the project, there is little residual improvement in the process of technology transfer with little possibility of continued financial support by end-users.
- Because emphasis was on capacity building and institutionalization, previous R&D projects were highly diffuse, addressing a variety of sectors without concerted focus on key problems. In addition, little accompanying socioeconomic or financial analysis was performed to determine the feasibility of applying research results in technological processes. A process for determining priorities and limitations on the selection of problems to be studied should be established. It is expected that intensive focus of research teams on the problems' solution, and careful analysis of the acceptability and feasibility of the technology transfer will have the desired impact on actual problems.
- The ability of universities and institutes to contribute to the solution of problems varied widely. Participation in problem solution

by less qualified institutions is, nevertheless, important to build their capacity. Therefore, while maintaining a problem-focus, a targetted definition of less to more complex problems must be developed and assigned to institutions according to their capabilities.

- Key bureaucratic constraints still exist in the managerial systems at both AID and the GOE. These originate primarily from rigid policies in both countries. For an effective R&D program, flexibility in management and procurement will be an essential requirement.

V. SUMMARY OF FEASIBILITY ANALYSES:

A. Technical Analysis:

The project design emphasizes end-user participation in selecting STC problems and adopting results. Initial priority problem areas have been selected and criteria established for choosing new problem areas during the course of the project. Technical liaison activities are included in the design to ensure continued interaction with end-users. Technical liaison review groups and special study funds are made available to define problems in detail for competitively soliciting RD&E proposals. Adequate review and performance tracking and evaluation procedures are included. Problem priorities and socioeconomic effect are used to determine RD&E project funding ceilings. Advanced technology topics are problem and capacity building oriented, and all areas stress interdisciplinary approaches. The Egyptian S&T capacity is judged adequate to meet STC objectives, but training is included to enhance capabilities where needed. Significant changes in Egyptian S&T operations will be required, but reasonable steps are included in the design to encourage and promulgate change. These changes include: a) establishing a technical liaison unit to continuously interact with end-users and identify new problems; b) the use of information services as a tool for applying existing research results; c) the integration of social and economic studies with physical science and engineering activities. The project is judged technically feasible. A detailed technical analysis is in Annex F.

B. Cost Effectiveness Analysis:

RD&E projects do not lend themselves to traditional approaches of economic analysis because the outcomes are not easily predicted, the costs of implementing technologies are speculative, and many RD&E projects remain to be identified. The management structure, competitive bidding and the management information system (MIS) will help ensure the cost effectiveness of individual subprojects. Emphasis on end-user participation and socioeconomic impact are important factors in the cost effectiveness of STC and the project is evaluated as economically sound. A full explanation appears in Annex G.

C. Social Soundness Analysis:

The policy environment in which the S&T community has functioned has led to isolation from the productive sectors and from much of the decision-making on technologies chosen for development. The GOE has made several pronouncements since 1982 on the need for greater S&T focus on specific problems to optimize resource use. The GOE has also called for closer links between S&T institutions and the productive sectors, and more frequent use of task forces with end-users membership to provide advice and action on development policies. There are, however, deeply rooted institutional and attitudinal factors that provide some resistance to using science and technology in this way. While these reservations take time to overcome, AID funded projects have

~~helped in demonstrating a positive role for S&T in solving development problems.~~

The social consequences of STC outputs will vary among the different problem areas, depending on their local or national focus. The involvement of end-users and funding analyses of social and economic factors important to technology acceptance and use will help to ensure the diffusion of positive results. Further, information services incorporated in the project will foster exchange among researchers and between researchers and society. The primary beneficiaries are the end-users and communities who adopt the solutions developed in the subprojects. The secondary beneficiaries are the research scientists, engineers and end-users directly involved in problem definition, testing and evaluating technical inputs, and developing plans to implement solutions.

Many of the planned activities will have direct effect on the majority who live in rural areas (including the rural poor) through employment opportunities, agricultural improvement and improved environment. Women will have equal access to subproject activities and, while no design element is included to address the role of women, application of technology is expected to benefit Egyptian society as a whole and, in some cases, women in particular. A social soundness analysis is provided in Annex H.

D. Environmental Analysis:

STC, because of its research and educational nature, does not require an Environmental Impact Statement or the preparation of an Environmental Assessment, as explained in Annex I. The project meets the criteria for a categorical Exclusion under 22 CFR 216.2(c)(2)(i)(ii), which was approved by AID/Washington in State Cable 87-075933 with the understanding that proposed research projects address potential environmental impacts. This was included in one of the criteria for evaluating competitive RD&E proposals. Many of the initial subprojects are expected to have positive local environmental impacts. Recombinant DNA in agricultural crops planned for the latter stages of STC, will be subject to review with applicable Egyptian, NIH, EPA, or USDA regulations governing this type of research as a condition of subproject approval.

E. Administrative Analysis:

The Project Secretariat, the single funding, monitoring and coordination unit of STC, will operate under the umbrella of ASRT as a "Unit of Special Character", under G.O.E. Presidential Decree Number 70 for 1986. This decree gives to ASRT the possibility of establishing units that have greater management flexibility and the ability to generate and administer funds. As such, the Secretariat's operations are technically, financially and administratively autonomous. This is the type of autonomous arrangement that has proven so successful in USAID's ORT and Child Survival projects. The STC organization and management system is designed to ensure:

- effective interaction between users and producers of RD&E takes place;
- problem area selection is performed in an objective manner;
- ~~resource allocations are commensurate with problem priorities and needs;~~
- adequate inducements are available to motivate the best scientists and engineers to engage in applied RD&E;
- responsive proposals are forthcoming and are reviewed in a competitive, timely and sound manner;
- satisfactory standards of technical and financial accountability are maintained without impeding RD&E progress.

Annex J fully explains the organization/management approach.

F. Financial Analysis:

STC is a non-revenue producing effort whose major financial element (two thirds of the total project) is used for procuring RD&E services to address defined problem areas. Cost estimates for these competitively awarded services were developed from model budgets of specific subproject activities for which technical detail and insight were available. These budgets included compensation, consultants, commodities, training, travel, information costs and any other special items. Total RD&E costs were then extrapolated from these budgets assuming that 50-60 subprojects would be financed over the LOP, with an estimated distribution of 50% large and 50% small.

Steering Committee and Project Secretariat costs were derived from staffing plans and activity schedules using anticipated compensation scales. Scientific and technical information services is an ongoing activity under the Applied S&T Project 263-0016 and future costs were projected. Both of these support service cost estimates are valid.

Escalation of dollar costs and local cost derived from dollars was included at a compounded annual rate of 5% per year for all the above activities with a 2% contingency to offset the expected decreases in the exchange rate of the Egyptian pound.

The Project Secretariat's system for funding flow and control will be established with initial assistance and training in GCE and AID procedures provided through a U.S. management systems contractor. This activity (training and TA) will develop the Secretariat's skills to a level that enables USAID to certify its capability for financial control. This activity will be initiated through pre-project funds authorized under the current S&T for Development project and will be continued with funds allocated under this project. Fund transfers to the Secretariat will be made on 90 days requirement and will be based on a yearly work plan and budget prepared by the Secretariat and submitted to the Steering Committee and AID two months before the beginning of the U.S. fiscal year (October 1st).

USAID will reserve funds for participant training which will be arranged through HRDC/TNG and OIT. RD&E projects will have budgets for training and be

debited for these costs. USAID will also reserve funds for monitoring, evaluation and audit. The Secretariat will hire a PSA under a Host Country Contract to facilitate commodity procurement.

Recurring costs are not an issue in the STC project. The project is research focused and does not support institutional development in the strict sense. Most local costs will be research project budgeted and funded. The Steering Committee and Project Secretariat are the project's only annualized local costs. Both of these units will terminate at the end of the project, thus their support cost needs will also end.

If ASRT is impressed with the effectiveness of the Project Secretariat approach, then it may decide to keep it and develop a funding mechanism. However, the Secretariat's continued existence is not a part of the project purpose.

The financial plan is reasonable and procedures for financial control appear adequate pending evaluation of the Secretariat's capabilities, once it is established and its members trained.

A detailed financial plan appears in Annex K.

VI. IMPLEMENTATION PLAN:

A) Administrative Arrangements:

1. Government of the Arab Republic of Egypt (GOE):

The Deputy Prime Minister of Planning and International Cooperation (MPIC) will be the signatory to the Project Grant Agreement (Pro Ag) and to all subsequent Pro Ag amendments.

2. GOE Implementing Agencies:

The Minister of State for Scientific Research will issue a decree establishing the STC Steering Committee and the Project Secretariat as a "Unit of Special Character" under the umbrella of the ASRT. The Minister will consult with USAID prior to naming representatives to the Steering Committee, and the Project Secretariat Senior Staff. This will be a condition precedent for initial disbursement of AID funds.

ASRT will be the coordinating agency for the STC. It will house the STC Project Secretariat and call Steering Committee meetings through the Project Secretariat Executive Director who will act as the Committee's secretary. The ASRT President will be Vice Chairman of the Committee. ASRT functional responsibilities will be : 1) annual funding transfers to the Project Secretariat; 2) annual report to USAID; and 3) evaluation and monitoring. The implementing agencies which will conduct research and apply its results are:

- 1) The universities through the foreign relation committee unit of the Supreme Council of Universities.
- 2) The national research institutes and in particular the National Research Center and the Development Research and Technological Planning Center of Cairo University.
- 3) Egyptian ministries.
- 4) Private and public sector organizations.

3. Project Disbursements:

Disbursements will follow procedures set forth in Project Implementation Letters (PILs) based on STC project performance and estimates of future requirements of the Project Secretariat. The Project Secretariat will prepare an annual plan which includes a review of the previous year's activities, a description of the overall thrust of the coming year's activities, a specific work plan and an operating budget. The plans must also address any proposed changes in selection criteria. Annual funding levels, within the constraint of STC authorization amounts, will be determined by STC project progress as

indicated through monitoring and evaluation and projected annual requirements. ~~This plan is to be submitted July 1st of each year.~~

B) Project Management:

The organizational structure and function of the project management is shown in Figure VI-1.

1. The Steering Committee:

The Steering Committee will provide overall policy guidance and oversight to the project and will award contracts larger than \$250,000. It will be chaired by the Minister of Scientific Research, and the Vice Chairman will be the President of the Academy of Scientific Research and Technology (ASRT).

Additional members will be:

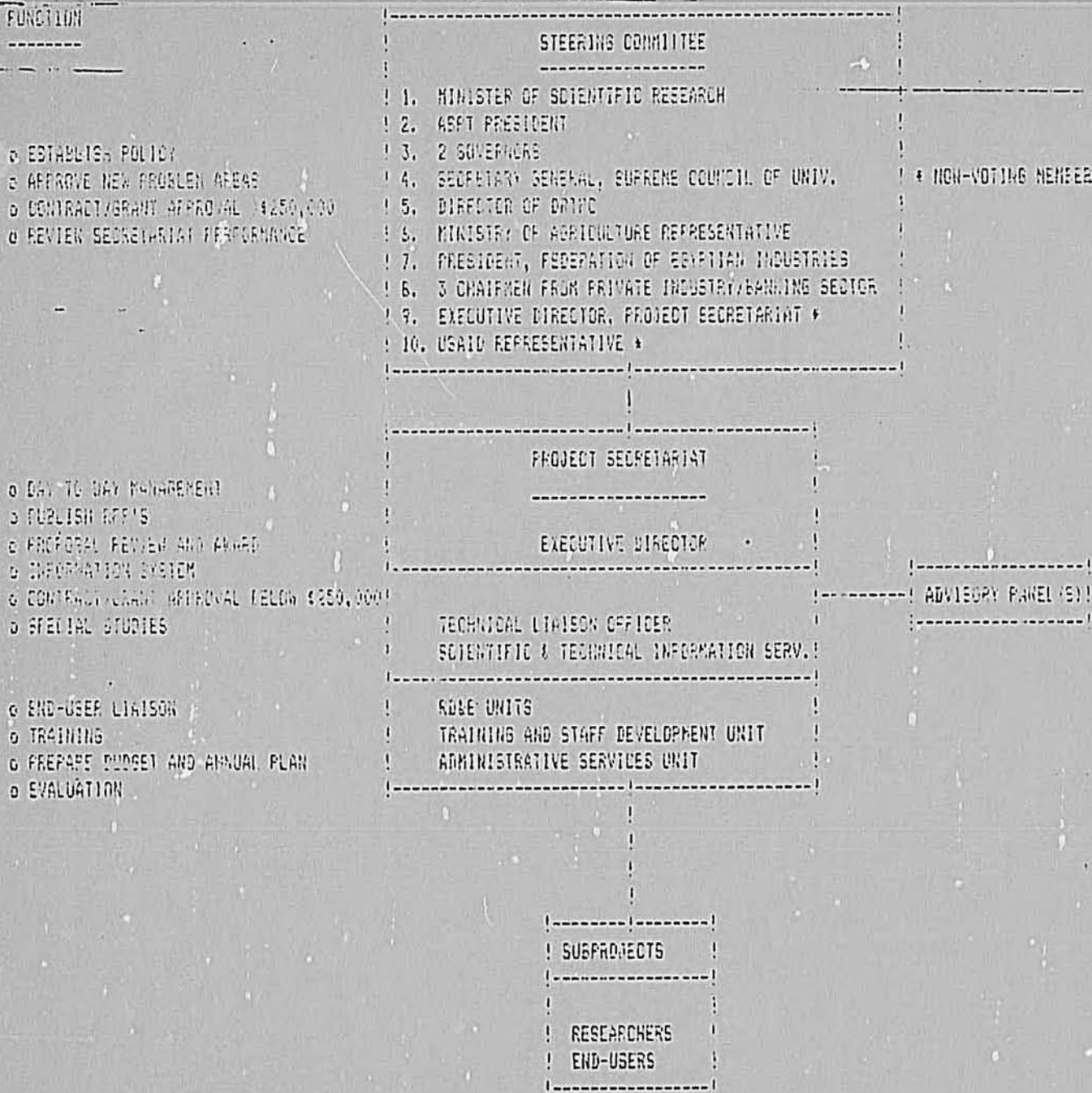
1. Two governors, one of whom will be the Chairman of the Interministerial Committee for Local Development (Amana);
2. The Secretary-General of the Supreme Council of Universities;
3. The President of the Federation of Egyptian Industries;
4. The Director of the Development Research and Technological Planning Center of Cairo University (DRTPC).
5. One representative from the Ministry of Agriculture;
6. 3 chairmen from Private Industry/Banking sectors;
7. The Executive Director of the STC Project Secretariat;
8. USAID project officer and the S&T office director, will be ex-officio members.

2. The Project Secretariat:

The Project Secretariat will be the central point for managing all project activities and operations. An Egyptian Secretariat Executive Director, to be selected on a competitive basis with the concurrence of USAID, will be delegated full authority and responsibility for the daily technical, management and administrative activities of the STC project.

The functional activities of the Secretariat include: executing the Steering Committee's approved policies and directives; recommending funding of research subprojects; awarding and monitoring contracts/grants; maintaining project records; and providing project support services. Secretariat responsibilities include: recommending policies and procedures for approval by the Steering Committee; providing data and analyses to the Steering Committee; solicitation and screening of proposals; awarding contracts/grants below \$250,000; transferring to and monitoring funds of subprojects; conducting special studies; preparing annual budgets and work plans; conducting special studies; conducting semi-annual subproject reviews; submitting quarterly reports; and liaison with the USAID S&T office.

FIGURE VI-1. SYD ORGANIZATIONAL STRUCTURE



The Executive Director will be assisted by two unit managers and their staffs: Training and Staff Development; and Administration. These units will perform different administrative functions and sustain R&D project assistance and support in training and contracting. A computerized Management Information System (MIS) will be established for tracking the various project activities, thus providing a framework for resource allocation, selecting problem areas and subprojects and permitting the end-users and producers of RD&E to interact constructively.

In order to support the Project Secretariat in its different technical functions, two additional services will be established:

- a) Technical Liaison Office
- b) Scientific and Technical Information (STI) services

a) Technical Liaison Office:

This office will assist the Steering committee and Project Secretariat in identifying research priorities, potential end-users of planned research and dissemination of research results to interested governmental and private sector entities. It will also identify end-users, research and information already available with a view to developing immediate applications consistent with the project's goals and objectives. The office will be composed of full time technical liaison agents responsible for bridging the gap among researchers and end-users in the industrial and agricultural sectors and in the governorates. Liaison agents will visit governorates and organizations in the productive sector on a frequent basis. They will identify specific problems in the research categories funded, and transmit information and technical data from research centers and publications to potential end-users.

b) Scientific and Technical Information Services:

The Project Secretariat will make use of the Egyptian National Scientific and Technical Information Network (ENSTINET) at the Academy of Scientific Research and Technology. ENSTINET was created under the AID Applied S&T Project 263-0016. ENSTINET's objective is to assist Egyptian problem solvers and decision makers to access and apply quality data and relevant, current information to developmental activities.

The ENSTINET structure is an open-ended, centrally coordinated, distributed network of sectoral information service organizations (ENSTINET "nodes"). The nodes currently provide selected information services in six of Egypt's vital sectors: agriculture development/reconstruction, energy, health care, industry, and science/technology. The organizations providing these services are located in, and are part of, ministries or agencies of these respective sectors.

A detailed description of ENSTINET services is provided in Annex L.

Under project activities, ENSTINET services will be enlarged to:

- Establish information extension services at eight regional user centers or regional universities.
- Extend database searches and document delivery services to regional universities.
- Establish indigenous S&T databases in each of the participating governorates or regional universities using three fundamental indicators: i) activities in S&T; ii) S&T projects, publications, and dissemination; iii) S&T services and physical resources such as laboratories and pilot plans. Once these databases are established at the governorates, they will be integrated into a Directory of Organizations in S&T to be used by all participating information nodes and extension centers.

3. USAID Management:

Project management and monitoring will be the responsibility of the Office of Science and Technology. A Project Officer will be responsible for the STC project and assisted, as needed, in monitoring, evaluating and reviewing all project aspects. The USAID Project Officer will be an ex-officio member of the Steering Committee. He will maintain contacts with the Project Secretariat and will monitor the work of the management systems contractor. USAID will have access to all documents issued by the implementing agencies, the Project Secretariat and the individual subprojects. USAID will approve the problem areas, monitor project progress, make field inspections, and allocate funds to the Secretariat. (This approach has USAID acting in a review/approval role that has been very successful in the University Linkages Project.)

C) Procurement Plan:

Procurement of goods and services will be the responsibility of USAID and the Project Secretariat. USAID will contract the services of a U.S. management systems contractor, local and U.S. consultants for support and services, U.S. training of Egyptian participants, and two IQCs for evaluation and audit.

The Project Secretariat will contract the services of a Procurement Services Agent, the information services of ENSTINET, and local and U.S. professionals, as needed, for its operations and research programs.

1. Pre-Project Activities:

Procurement of goods and services will be initiated using \$800,000 already allocated in the S&T for Development Project Grant Agreement, signed March 31, 1986. These initial activities will enable: (a) the U.S. management systems

contractor to be contracted for one year; (b) the Steering Committee and Project Secretariat to initiate their activities; and (c) the ENSTINET services from the Applied S&T Project (263-0016) to continue without interruption. Figure VI-2 summarizes the funding flow for the pre-project activities.

Because the Steering Committee and the Project Secretariat will not be fully established at this pre-project phase, all initial activities will be carried out by the Academy of Scientific Research and Technology. Coordination will be through the Academy's Director of Foreign Programs. During this initial period, ASRT responsibilities will be to:

- Initiate the different operational activities of STC.
- Advertise, select and contract for the STC executive director, the RD&E manager, accountant, the computer advisor and a secretary for one year, after receiving USAID approval.
- Act as a counterpart to the U.S. management systems contractor to prepare the RFPs for problem areas such as Lake Ecosystems, Construction Materials, and Crops for Semi-arid Lands, and initiate the contractor's activities with the Project Secretariat.
- Provide operating costs for office management and the Project Secretariat until Phase II funds are available.
- Support ENSTINET's current services and operations, and establish two regional access points to ENSTINET in Alexandria and possibly Suez Canal Universities. A PIL was issued in November 1986 allocating \$300,000 for ENSTINET services.

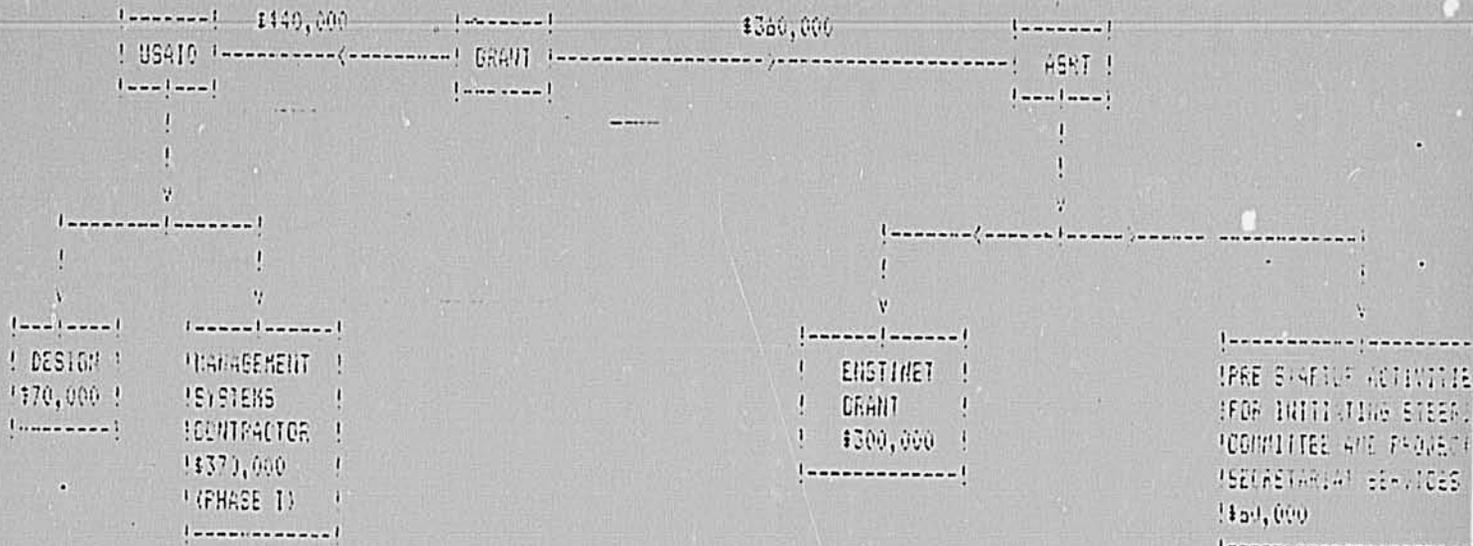
2. AID Contractual Arrangement: Technical Support Services:

(a) Management Systems Contractor:

A U.S. management systems contractor will be selected from an 8(a) firm, and directly contracted by AID for one year using Phase I funds authorized under the S&T for Development Pro Ag. [This could be extended for an additional 18 months using funds to be authorized under the STC project (Phase I.)]. The contractor will provide the Secretariat with the following services:

- Short-term consultants to prepare Requests for Proposals (RFPs) for the problem areas identified in the project description.
- Management training on organizational structure, operational procedures, accounting, and legal/financial procedures necessary to meet AID regulations and procedures for host country contracting of technical and procurement services.

FIGURE VI-2: FUNDING FLOW FOR PRE-EQUIPMENT ACTIVITIES - (PHASE I)



FUNDS ALREADY AUTHORIZED UNDER THE SNT FOR DEVELOPMENT PROJECT 263-0140 DATED 3/31/1965

~~A computer advisor to: (a) plan and define software and hardware; (b) develop a system design to meet daily operational needs of the project and administrative procedures; and (c) select a management information system (MIS).~~

- Establish the MIS and procure computer software and hardware.
- Assist in the establishing the Secretariat's Technical Liaison Office.

Extension of the services of the management systems contractor will depend upon need and satisfactory performance during Phase I and the early part of Phase II.

(b) Monitoring Support Services:

USAID will also contract for the services of:

- An Egyptian project specialist to assist the project officer in monitoring activities. This person will work directly with the Secretariat.
- Short term consultants to analyze new problem areas submitted for funding by the Steering Committee and to carry out specific policy studies for maintaining the S&T policy dialogue.
- Two Indefinite Quantity Contractors (IQCs). The first to conduct two external SIC project evaluations in FY 91 and FY 94, and the second to audit the SIC project.

(c) Participant Training:

USAID Training Office (TNG) will be responsible for arranging training. They will work through the Office of International Training (OIT) to identify suitable training facilities, prepare training programs and make necessary travel arrangements for participants. Training funds will be retained by USAID/Cairo and disbursed upon issuance of funded PIO/Ps. Procedures and mechanisms for training are included in the training plan (Section VI E).

3. Project Secretariat Contracting Arrangement:

(a) Egyptian Management Services:

The Project Secretariat will contract with individuals and other organizations to perform project support services. These services will be specific to: (a) the Steering Committee and Project Secretariat functions (baseline data collection, policy studies, technical review of proposals, etc.); (b) employment of project secretariat technical liaison agents; (c) research subprojects; and (d) organization and financing of meetings, workshops and project reviews.

The Project Secretariat will be responsible for selecting, contracting and employing these services, and payment procedures. To accomplish this, the Secretariat will assign two full time contracting officers and an administrative officer to carry out contracting and financial arrangements using standard AID approved procedures.

(b) Information Services:

The Project Secretariat will contract for the following services with ENSTINET:

- Performing training, consulting services and a coordinating role on behalf of network membership.
- Providing geographic extension of ENSTINET services to eight regional user communities. The first two, Alexandria and Ismailia (Suez Canal University), will be funded from the pre-project activities (see section VI.C.1).
- Accessing foreign data bases and documents for the major regional user communities and to the sector nodes.
- Building Egyptian S&T data bases in the governorates and the S&T directory of organizations, as explained in section VI.B.2.b.
- Initiating a pilot electronic mail system between two sector nodes.

(c) Commodity Services:

Procurement of local materials and supplies for subgrant activities, using shelf item rules, will be the responsibility of the Project Secretariat and the principal investigators of the RD&E subprojects. Procurement will follow AID policies and procedures. These will be included in the policies and procedures for proposal award which will be developed by the Project Secretariat. Procurement of equipment from the U.S. will be made through a Procurement Services Agent (PSA), contracted by the Secretariat under a host country contract mechanism.

After the Secretariat receives training from the U.S. management systems contractor, USAID will evaluate the Secretariat's ability to carry out a host country contract for procurement services. Assuming a positive determination, the Secretariat, assisted by the management systems contractor, will issue an RFP for the PSA services. The RFP and the selection of the PSA will be made according to Handbook 15, chapter 4.

The PSA's responsibilities will include, but not be limited to:

- Preparing detailed equipment specifications, including spare parts, supplies and accessories.
- Preparing laboratory requirements and equipment installation plans.

- Determining utilities requirements (power, water, air, gas) and confirm that necessary utilities are operable prior to installing equipment.
- Identifying training requirements to use new equipment and arranging training in the U.S., when required.
- Preparing a procurement plan and managing procurement funds.
- Procuring equipment and material on a CIF basis, clearing customs and shipping to subproject sites.

(d) Vehicle Procurement:

Local and national research programs will require vehicles for field work. We do not know exact numbers at present, but this could mean up to 8-10 jeeps, 2-3 carry alls or vans, and 2-3 trucks. Exact numbers and types will be determined as subgrant activities are fully developed, and a procurement decision shall be made at that time. Procurement of vehicles will be authorized in accordance with Handbook 11, chapter 3; for the special source requirements for motor vehicles.

4. Gray Amendment:

The USAID will contract the services of an 8(a) firm to work with ASRT and the Project Secretariat in developing the project management system and making it operational. USAID will review the lists of 8(a) firms and organizations and seek proposals from three firms on the basis of a scope of services. After proposal review and consulting with the AID minority contracting officer, an 8(a) direct contract will be awarded.

AID will contract the services of the selected firm for one year. The Mission may extend the contract for 18 months to further refine the administrative and management process. The possibility of such follow on work will be stated in the initial solicitation.

The estimated cost of the management systems contractor for Phase I is \$370,000. An 18-month extension will cost approximately \$700,000.

D) Commodity Program:

Known commodity categories include office equipment for the Project Secretariat, computer software and hardware, and equipment for initial research areas in the biotechnology and the computer based technology programs. Equipment lists will be prepared and updated as project needs are further developed.

The time needed for purchasing S&T equipment in other AID projects has ranged from 300-600 days following receipt of equipment lists. The procurement program proposed takes into account lessons learned, and intends to shorten the delivery time for the project equipment to 250-360 days as shown in the commodity schedule of Fig. VI-3. Major steps are:

~~Assigning the overall procurement process to an experienced Procurement Services Agent (PSA).~~

- Issuing a bank Letter of Commitment (L/COI) directly through the PSA, who will then issue letters of credit to suppliers.
- Early submission of export licenses for U.S. customs, and appointing a Secretariat staff member responsible for meeting requirements of Egyptian customs authorities.

1. Waivers of AID Procurement Regulations:

The following waivers, from AID procurement regulations, are proposed:

- a. The restriction which limits the unit price of imported shelf items, to \$5,000, and the \$250,000 limit on the total amount of imported shelf items by AID, regardless of source/origin for Code 899, Free World countries. This is found necessary because shelf item commodities constitute an important element in conducting research in the laboratories and at the pilot plant scale. While the shelf items cannot be concretely defined at present, an unofficial estimate value of these items is approximately \$1.1 million of which \$0.5 million will be from Free World countries (Code 899). The remaining \$500,000 worth will have its origin in Egypt or in Code 941. Similarly, the unit price of some local items will exceed the \$5,000 limit. A justification for this waiver is provided in Annex M.
- b. The use of informal competitive procedures by issuing Requests for Quotations (RFQ) instead of formal Invitations for Bids (IFB). It is difficult to develop adequate specifications for some of the most complex equipment because it will have to be adapted to the environmental operating conditions. A justification for the Mission Director permitting the use of negotiated procurement instead of formal procurement is attached in Annex M.
- c. The requirement to advertise in the AID Procurement Bulletin for commodity values of more than \$25,000 but less than \$100,000. This waiver is necessary because the number of U.S. manufacturers supplying specialized equipment is limited and manufacturers are often reluctant to bid on Egyptian tenders for small unit quantities. Competitive procurement will be ensured by general advertising. Small value procurement regulations stated in Handbook 11, chapter 3, will be used to solicit offers from U.S. manufacturers. A justification is provided in Annex M.

2. Customs:

One important cause of delay in importing scientific equipment is the time and effort required to release equipment from U.S. and Egyptian customs.

U.S. customs, under "Project Exodus," requires an export license for all advanced technology and specialized scientific equipment. In addition, an investigation of the consignee is conducted to ensure the equipment will not be transferred to Eastern Bloc countries.

After receiving application for an export license signed by the buyer, two weeks to three months are required by the Department of Commerce to process and issue a license. In order to expedite the process, the PSA will submit export license applications immediately after an award is made. The license can be processed during the time it takes the manufacturer to deliver the equipment. It will be the responsibility of the PSA to maintain permanent contacts with U.S. Customs in order to expedite this process.

There also are problems in having scientific equipment released from Egyptian Customs. The following will help expedite the process:

- (a) Submission of the Presidential Decree for the Pro Ag: The Project Secretariat will submit the ratified PROAG with Annex II (Standard Provisions), and the Presidential Decree for the STC agreement to Customs.
- (b) Special Arrangement for Releasing Chemicals, Short Life Isotopes and Enzymes: The Project Secretariat and the PSA local representative will make special arrangements to release these types of supplies from customs quickly. This can be done under the "temporary release" (ifaoukoutat) system: the Project Secretariat provides a written request for immediate release of supplies and certifies that the receiving institution will pay duties or obtain a tax exemption within a month.

The Project Secretariat will hire an employee to address customs problems and ensure that proper authorization, stamps and certificates are issued, enabling the PSA local representative to proceed with customs clearance.

E) Training Plan:

The objectives of the training program are to:

- Upgrade the skills of research teams to accelerate research progress.
- Develop end-user skills and capabilities to adopt and assimilate technologies.
- Enhance research capacities in biotechnology, genetic engineering and computer based technology.

Both long-and short-term training will be conducted: in-country, in the U.S. and in other developing countries such as India or Turkey. Training will differ in duration and type for each of the three project elements. Table

~~VI-4~~ provides an illustrative summary of the number of participants and the duration of training under each element. An estimated 95 persons are expected to receive U.S. training, 324 persons may receive in-country training and 25 participants may receive third country training.

1. Training under the National Research Program:

Training will involve research professionals and end-users. Local training will be heavily emphasized, and approximately 230 persons will receive training at Egyptian universities and research centers for approximately 120mm. Training programs will be developed for the end-users to interact with the research teams in adapting technologies to the end-users situation.

U.S. training will be on-the-job and will involve research team members. Training duration will vary from 1-2 months, for approximately 27 persons for a total of 59 mm.

Study tours for approximately seven people will be organized in a third country such as India or Pakistan where appropriate technologies for brick manufacturing have been developed and successfully introduced.

2. Training under the Local/Regional Research Program:

Training will emphasize capacity building at local/regional universities and expose end-users to adopting simple and appropriate technologies. Approximately 50 persons from local university research teams will attend tailored training courses at research centers and universities such as Cairo, Ein Shams and Alexandria.

U.S. training will be limited to senior members of research teams and end-users, and will take the form of study tours, seminars and workshops. Approximately 36 staff members will be trained for a total level of 36 mm.

Study tours will be organized for the research team members and end-users in third world countries in which similar technologies have been developed and successfully used. Approximately 18 persons will participate in these visits.

3. Training under the Advanced Technology Program:

In-country training will be directed principally at end-users and will be carried out by members of the research teams. A total of 44mm of training is estimated.

U.S. training will emphasize formal academic training to enhance the capacity of the academic research staffs at the Ph.D. and post doctoral levels. Approximately 16 persons from both the biotechnology and computer based technology programs will receive U.S. academic training for periods varying from 2 months to 2 years. Participants must conduct research related to project activities during their academic training in the United States, and when they return.

FIGURE VI-4: ILLUSTRATIVE LIST OF TRAINING PARTICIPANTS

	FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		TOTAL	
	P*	MM †	P	MM	P	MM	P	MM	P	MM	P	MM	P	MM
National Research Program														
- U.S.	1	3	4	10	10	23	9	18	3	5			27	59
- In-country			51	29	89	45	65	33	25	13			230	120
- Third country			3	3			4	4					7	7
Local Research Program														
- U.S.			4	4	7	7	12	12	10	10	3	3	36	36
- In-country			7	6	7	6	22	17	15	12			52	41
- Third country			5	10	3	3	5	10	5	10			18	33
Advanced Technology Program														
- U.S.	2	7	7	19	6	34	7	20	6	18	4	18	32	116
- In-country	3	3	7	7	10	10	10	10	7	9	5	5	42	44
SUBTOTAL														
- U.S.	3	10	15	33	23	64	28	50	19	33	7	21	95	211
- In-country	3	3	65	42	106	61	97	60	48	34	5	5	321	205
- Third country	0	0	6	13	3	3	9	14	5	10			25	40
TOTAL														
	6	13	88	88	132	128	134	124	72	77	12	26	444	456

* P = No. of Persons
 † MM = Man Months

Academic training in the biotechnology area may include: ~~plant-cell-and-tissue culture of legumes and date palm; applied microbiology and fermentation technology; industrial fermentation; and recombinant DNA technology.~~

Academic training in computer based technology may include: hardware/software interfacing for developing communications protocols; interrupting handling routines; fault diagnosing routines; failsafe routine; software environments for CAD/CAE/CAI techniques; and different design aspects for knowledge-based/expert systems.

4. Training arrangements:

In responding to the Secretariat's Requests For Proposals, offerors will be required to identify the participants and the training areas for in-country and U.S. training. U.S. participant training will follow AID rules and regulations set forth in Handbook 10.

- a. Local training: The Secretariat's training manager will be responsible for identifying local training centers, placement, travel arrangements, and payment of fees. A local currency fund is included as part of the grant services in the project elements.
- b. U.S. training: Training in the U.S. will be arranged by the USAID/Cairo Training Office and by the Office of International Training (OIT) in AID/W. This is the most suitable arrangement given the wide range of training programs. The Secretariat will provide nomination letters to USAID/TMG which will, in turn, inform OIT. OIT will prepare specific training plans. USAID/TMG will issue the PIO/P, and arrange allowances, advances and travel. Participants not meeting training English requirements will study English at the American University in Cairo.
- c. Third country training: Training in third countries will be in countries with prior experience in a particular problem area. Study tours will be arranged by OIT in collaboration with other USAID training offices. HRDC/TMG will be responsible for arranging allowances, advances and travel with the USAID Mission of the appropriate third country.

5. Training follow up and evaluation:

Training follow-up and evaluation will be performed by three groups:

- The Project Secretariat will prepare a questionnaire to assess the usefulness of in-country training.
- An independent evaluation team will carry out the interim and final project evaluations.
- USAID/TMG office will interview participants upon return from the U.S. or third countries.

F) Cost Estimates: Financial Plan and Funding Flow:

1. Summary of Financial Plan:

The AID contribution over the eight-year Life of Project (LOP) is \$36.0 million. The host country contribution is L.E. 15.2 million (\$7.0 million).

Table VI-5 summarizes STC illustrative costs for the three research elements (national, local/regional, advanced technology) and for the supporting services (Egyptian management services, information services, technical support services, evaluation and audit). Table VI-6 summarizes the STC inputs as a function of project outputs. Illustrative tables for each of the budget categories are included in Annex K.

AID's input will be a grant, incrementally funded, with an initial obligation of \$8.04 million for FY'87. Subsequent obligations are: FY'89-\$12.0 million; FY'90-\$5.96 million; FY'91-\$10.0 million. All obligations are subject to the availability of funds, and MPIC and USAID decisions to allocate the necessary budget for the categories contemplated in Table VI-5. The incremental funding is based on the budget schedules and planned expenditures of USAID funds shown in Tables VI-7.1 and VI-7.2.

AID will fund administrative and technical support services for the STC project, commodities, in-country and U.S. training, and information and documentation services. Compensation rates and policies for incentives will be regulated by the Secretariat and submitted to USAID for prior approval. A justification for incentive payment is provided in Annex M and will be the basis for requesting a waiver in accordance with Mission Order 3-10.

The GOE contribution will cover the basic salaries of the researchers, normal operating and maintenance costs, the universities and research institutes' overhead, customs duty fees, facilities and remodeling costs and local equipment purchase. Cash contributions from governorates and private/public sector firms which request RD&E studies will also be encouraged to the extent possible.

Foreign exchange will be required for an estimated 40% of the AID grant. Local currency, 60% of the AID grant, will be obtained through conversion from the U.S. Grant at the highest rate of exchange prevailing and declared for foreign exchange currency by competent authorities of the Arab Republic of Egypt at the time the disbursements are made. Local currency is required for: paying Secretariat staff salaries; paying salaries of ENSTINET's central coordinating group; consulting fees for local consultants; incentives; office equipment, local materials and supplies; and for local information services.

Procurement will be eligible under AID foreign exchange and local cost financing regulations. The equipment costs include commodity costs, shipping, insurance, PSA fees, maintenance and special supplies needed for carrying out research subprojects.

Figure 19-5: Component Costs by Activities and Funding Source \$1000

	AID Grant			Host Country			
	FX \$	LC \$	Total \$	GGE in kind LE	GGE in cash LE	Private/Public Sector LE	Total LE
1. National Research Program							
Subgrant							
- Research Contract	610.00	5,700.00	6,310.00	1,900.00	--	400.00	2,300.00
- Commodities	3,090.00	460.00	3,550.00	1,500.00	330.00	--	1,830.00
- Participant Training	200.00	--	200.00	60.00	--	--	60.00
- Renovation/facilities	--	--	--	250.00	170.00	50.00	470.00
SUBTOTAL	3,840.00	6,160.00	10,000.00	3,750.00	500.00	450.00	4,700.00
2. Local Research Program							
- Research Contract	410.00	6,070.00	6,480.00	2,600.00	--	250.00	2,850.00
- Commodities	1,355.00	195.00	1,550.00	640.00	140.00	--	780.00
- Participant Training	200.00	--	200.00	22.00	--	--	22.00
- Renovation/facilities	--	--	--	578.00	150.00	--	728.00
SUBTOTAL	1,965.00	6,265.00	8,230.00	3,840.00	290.00	250.00	4,380.00
3. Advanced Technology Program							
A. Biotechnology							
- Research Contract	550.00	2,350.00	2,900.00	1,000.00	--	--	1,000.00
- Commodities	2,520.00	130.00	2,650.00	1,100.00	240.00	--	1,340.00
- Participant Training	400.00	--	400.00	30.00	--	--	30.00
- Renovation/facilities	--	--	--	270.00	200.00	--	470.00
SUBTOTAL A.	3,470.00	2,480.00	5,950.00	2,400.00	440.00	--	2,840.00
B. Computer Based Technology							
- Research Contract	450.00	2,350.00	2,800.00	600.00	--	100.00	500.00
- Commodities	1,335.00	165.00	1,500.00	400.00	140.00	--	540.00
- Participant Training	250.00	--	250.00	20.00	--	--	20.00
- Renovation/facilities	--	--	--	200.00	120.00	--	320.00
SUBTOTAL B.	2,035.00	2,515.00	4,550.00	1,220.00	260.00	100.00	2,040.00
SUBTOTAL A+B.	5,505.00	4,995.00	10,500.00	4,020.00	760.00	100.00	4,880.00
4. Egyptian Reg'l Services							
- Project Secretariat	50.00	2,280.00	2,330.00	200.00	--	--	200.00
- Equipment/facilities	--	150.00	150.00	80.00	90.00	--	170.00
SUBTOTAL	50.00	2,430.00	2,480.00	280.00	90.00	--	370.00
5. Information Services (ENSTINE)							
- Technical Services	215.00	455.00	670.00	300.00	100.00	--	400.00
- Information/data base	1,285.00	445.00	1,730.00	--	120.00	--	120.00
- Communications/engr.	300.00	--	300.00	210.00	140.00	--	350.00
SUBTOTAL	1,800.00	900.00	2,700.00	510.00	360.00	--	870.00
6. Technical Support Services							
- Host system contractor	700.00	--	700.00	--	--	--	--
- Monitoring sup. services	277.00	223.00	500.00	--	--	--	--
- Evaluation & Audit	558.00	92.00	650.00	--	--	--	--
SUBTOTAL	1,535.00	315.00	1,850.00	--	--	--	--
GRANT TOTAL	14,735.00	21,265.00	36,000.00	12,400.00	2,000.00	800.00	15,200.00

* Includes local installation, services and maintenance, storage, customs clearances and fees

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FIGURE 1.8: INPUTS AND OUTPUTS (X10,000)

OUTPUTS	National (Research Program (25 projects)	Local/Regional (Research Program (25 projects)	Advanced Technology (27 projects)	Supporting & Services	Total
Research Contract	6,740.00	6,500.00	5,700.00	6,650.00	25,120.00
Commodities (Equipment and Supplies)	3,140.00	1,550.00	9,150.00	350.00	9,810.00
Participant Training	200.00	200.00	650.00	20.00	1,070.00
Totals	10,280.00	8,250.00	16,500.00	7,050.00	36,000.00

* Includes Egyptian management services (salaries, incentives, compensation, technical and administrative costs, etc.), information services, technical support services (management system contractor), monitoring support services, evaluation and audit.

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FIGURE VI.7.1.: OBLIGATIONS (\$1000)

Item	FY 87		FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		FY 94		TOTAL FY	TOTAL LC	TOTAL
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC			
National Program	418.00	810.20	0.00	0.00	2,182.00	2,029.80	1,010.00	1,570.00	230.00	2,130.00	0.00	0.00	0.00	0.00	0.00	0.00	3,840.00	5,750.00	10,590.00
Local/Reg. Program	363.40	863.90	0.00	0.00	741.60	1,836.20	440.00	1,330.00	420.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	1,965.00	6,255.00	8,220.00
Adv. Technology	1,511.00	983.40	0.00	0.00	1,624.00	1,411.60	545.00	910.00	1,825.00	1,650.00	0.00	0.00	0.00	0.00	0.00	0.00	5,505.00	4,995.00	10,500.00
Egyptian MF Services	55.60	833.64	0.00	0.00	34.40	553.36	0.00	323.00	0.00	452.00	0.00	0.00	0.00	0.00	0.00	0.00	90.00	2,410.00	2,500.00
Information Services	865.80	465.40	0.00	0.00	561.20	264.60	175.00	75.00	178.00	75.00	0.00	0.00	0.00	0.00	0.00	0.00	1,800.00	900.00	2,700.00
Tech. Support Services	750.36	63.40	0.00	0.00	65.64	54.60	41.00	34.00	89.00	72.00	0.00	0.00	0.00	0.00	0.00	0.00	975.00	224.00	1,200.00
Evaluation and Audit	0.00	0.00	0.00	0.00	200.00	70.00	--	--	289.00	92.00	0.00	0.00	0.00	0.00	0.00	0.00	583.00	112.00	695.00
TOTAL OBLIGATIONS	3,994.16	4,021.84	0.00	0.00	5,428.84	6,290.16	2,211.00	4,062.00	3,030.00	6,962.00	0.00	0.00	0.00	0.00	0.00	0.00	14,634.00	21,358.00	35,992.00
TOTAL FY		8,014.00		0.00		11,719.00		6,273.00		9,972.00		0.00		0.00		0.00			

FIGURE VI.7.2.: EXPENDITURES (\$1000)

Item	FY 87		FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		FY 94		TOTAL FY	TOTAL LC	TOTAL
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC			
National Program	0.00	0.00	120.00	220.00	130.00	320.00	600.00	965.00	1,750.00	1,335.00	1,010.00	1,390.00	150.00	1,220.00	80.00	910.00	3,840.00	5,360.00	9,200.00
Local/Reg. Program	0.00	0.00	65.00	310.00	185.00	320.00	405.00	835.00	450.00	1,255.00	440.00	1,330.00	370.00	1,230.00	50.00	975.00	1,965.00	6,255.00	8,220.00
Adv. Technology	0.00	0.00	460.00	100.00	540.00	605.00	1,825.00	780.00	310.00	850.00	545.00	910.00	1,510.00	875.00	315.00	795.00	5,505.00	4,995.00	10,500.00
Egyptian MF Services	0.00	0.00	20.00	374.00	30.00	371.00	20.00	313.00	20.00	328.00	0.00	323.00	--	344.00	--	354.00	90.00	2,410.00	2,500.00
Information Services	0.00	0.00	373.00	225.00	406.00	190.00	310.00	180.00	358.00	155.00	175.00	75.00	178.00	75.00	--	--	1,800.00	900.00	2,700.00
Tech. Support Services	0.00	0.00	284.00	27.00	481.00	28.00	37.00	30.00	39.00	33.00	41.00	34.00	43.00	35.00	41.00	33.00	975.00	224.00	1,200.00
Evaluation and Audit	0.00	0.00	--	--	--	--	--	--	200.00	70.00	--	--	--	--	--	--	583.00	112.00	695.00
TOTAL EXPENDITURES	0.00	0.00	1,322.00	1,316.00	1,777.00	1,837.00	3,197.00	3,163.00	3,127.00	4,082.00	2,211.00	4,062.00	2,251.00	3,775.00	775.00	3,193.00	14,581.00	21,358.00	35,939.00
TOTAL FY		0.00		2,635.00		3,614.00		3,366.00		7,163.00		6,273.00		6,050.00		3,972.00			

2. The Cost Estimate Model:

The illustrative research budget, Table VI-5, is based on a cost estimate model. Escalation of dollar cost and local costs derived from U.S. dollars was included at a compounded annual rate of 5%. A 2% contingency was added to offset the expected decreases in exchange rate of the Egyptian pound.

To arrive at approximate research program costs, model budgets were prepared for each of the five problem areas with at least eight cost elements for each budget. Percentages of total project costs were calculated for cost elements and, when more than one project was available, averages were taken.

Research subprojects were then designated as either large (\$1.0 million and above) or small (\$25,000-\$50,000) with the latter numbering one-half of the former. With a "schedule" of projects, the unit size and the project element costs could be calculated from the percentages available. The model was selective in that individual percentages were applied to national and local problems and to each of the two advanced technology categories. This model is limited in statistical validity. The resulting "budgets" are believed representative of typical RD&E projects in these topics. The level of effort and suggested number of subprojects (approximately 60 over an eight year period) are consistent with current and projected research capacities.

3. Financial Flexibility:

The Project Secretariat may transfer funds between the three research programs within 15% of an area line item without receiving prior USAID approval. All other shifts will require prior USAID approval.

4. Funding Flow:

Figure VI-8 shows the funding flow for the STC project. In order to be consistent with USAID method of financing described in the next section, the funding flow was based on Fig. VI-9 which represents the illustrative STC budget arranged by input categories (technical services, commodities, training and support services).

USAID will retain and administer the funds related to: (a) the U.S. management systems contractor; (b) monitoring support services; (c) U.S. participant training and (d) the two IQCs for evaluation and audit. The total amount of funds to be administered by AID is approximately \$3.0 million.

The Project Secretariat will administer a total of \$33.0 million. These funds will be for: 1) the three Research Program subgrants (\$18.74 million); 2) Egyptian Management Services for project operations and management costs (\$2.5 million); 3) an information services contract with ENSTINET (\$2.6 million); 4) commodities procurement (\$8.2 million, including PSA fees); and 5) local materials and supplies (\$0.95 million).

FIGURE 1-1-5 COMPONENT FUNDING PLAN

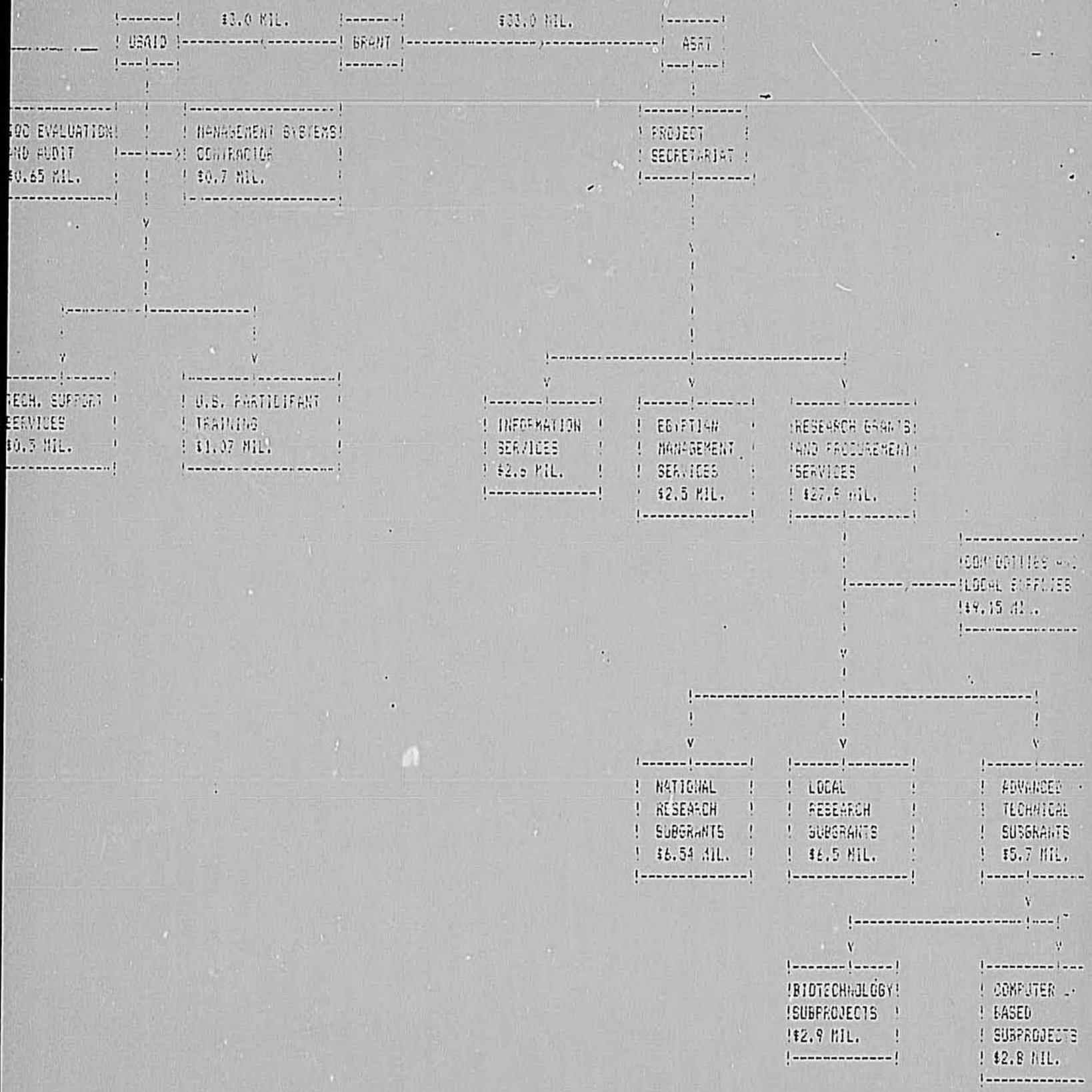


Figure VI-9: Illustrative HUD budget (USD)

	Life of Project			Host Country Contribution			
	EA	LC	Total	BDE in kind	BDE in cash	Priv. Fund ec.	Total
1. Grant Services							
A. Research Contract							
- National Research Program	640	5900	6540	1900	-	400	2300
- Local Research Program	410	6050	6460	2600	-	250	2850
- Biotechnology Program	550	2350	2900	1000	-	-	1000
- Computer Based Technology	450	2350	2800	800	-	100	900
SUBTOTAL	2050	16650	18740	5300	-	750	7050
B. Egyptian Management Serv.							
- Project Secretariat 1/	70	2240	2310	200	-	-	200
- Equipment/Supplies	-	150	150	-	60	-	60
SUBTOTAL	70	2410	2480	200	60	-	260
C. Information Services							
- Technical Services	215	455	670	300	100	-	400
- Information database	1285	445	1730	-	120	-	120
- Equipment/Supplies	200	-	200	200	130	-	330
SUBTOTAL	1700	900	2600	500	350	-	850
D. Local Materials/Supplies							
- National Research Program	-	440	440	-	-	-	-
- Local Research Program	-	195	195	-	-	-	-
- Biotechnology	-	130	130	-	-	-	-
- Computer based Technology	-	165	165	-	-	-	-
- Renovation/facilities	-	-	-	1420	720	50	2190
SUBTOTAL	-	950	950	1420	720	50	2190
TOTAL Grant Services	3820	20950	24770	8420	1150	800	10370
2. Participant Training							
- National Research Program	200	-	200	60	-	-	60
- Local Research Program	200	-	200	22	-	-	22
- Biotechnology	400	-	400	30	-	-	30
- Computer Based Technology	250	-	250	20	-	-	20
- Management Services	20	-	20	4	-	-	4
- Information Services	100	-	100	4	-	-	4
TOTAL	1170	-	1170	140	-	-	140
3. Commodities 2/							
- National Research Program	3000	-	3000	1500	330	-	1830
- Local Research Program	1355	-	1355	640	140	-	780
- Biotechnology	2520	-	2520	1100	240	-	1340
- Computer Based Technology	1335	-	1335	600	140	-	740
TOTAL	8210	-	8210	3840	850	-	4690
4. Technical Support Services							
- Management system contr.	700	-	700	-	-	-	-
- Monitoring Support Serv.	277	223	500	-	-	-	-
- Evaluation/Audit	558	92	650	-	-	-	-
TOTAL	1535	315	1850	-	-	-	-
GRAND TOTAL	14735	21265	36000	12400	2000	800	15200

1/ Includes salaries, compensation, local travel & per diem, meetings, local services

2/ Includes equipment, spare parts, shipping, insurance, fee and other related costs

3/ Includes local equipment purchase; services, installation, storage, customs fees

The Secretariat will annually present the Steering Committee and USAID the projected yearly allocations for: a) national; b) local/regional; and c) advanced technology subprojects.

ASRT will administer the funds related to ENSTINET services and the pre-project activities for the Steering Committee and the Project Secretariat.

5. Method of Implementation and Financing:

The following methods of financing are proposed for the procurement of technical and commodity services:

<u>Services</u>	<u>Contract Mode</u>	<u>Method of Financing</u>	<u>Estimated Amount</u>
1. Procurement contract	Host country		
A. PSA fee	with a PSA	AID direct L/COM	\$8.2 million
B. Equipment		Bank L/Com	
2. Management system contractor	8(a) contract	Direct Reimbursement	\$0.79 million
3. Monitoring support services	AID direct contract and PSC's	Direct Reimbursement	\$0.44 million
4. IQC audit	AID direct contract	Direct Reimbursement	\$0.1 million
5. IQC evaluation	AID direct contract	Direct Reimbursement	\$0.5 million
6. Participant Training	PIO/P	Direct Reimbursement	\$1.16 million
7.a. Research grants	Project Implementation Letters	Revolving advance in dollars and Egyptian pounds	\$18.74 million
b. Egyptian Management	"	"	\$2.5 million
c. Information Services	"	"	\$2.6 million
d. Local materials and supplies	"	"	\$0.95 million

6. Justification of L/COM payment to the Contractors and Revolving Advance to GOE:

The only use of a Letter of Commitment in the STC project is for paying the Procurement Services Agent (PSA). Because the Steering Committee and ASRT will have no foreign exchange available to them, the PSA fee will be paid by direct L/COM as authorized in HB 15, chapter 4. Commodity purchasing for the STC project will require numerous small transactions and various vendors. Issuance of a Bank L/Com is considered the best payment mechanism.

Because of the GOE budgetary limitation, it is necessary to give advances to the Project Secretariat. Replenishment of advances will be subject to liquidation of the previous advances and review of actual expenditure vouchers by AID.

7. Assessment of the Project Secretariat Contracting and Accounting Capabilities:

AID will assess the Project Secretariat's contracting and accounting capabilities after training has been provided by a U.S. management system contractor on GOE and AID procedures.

G) Monitoring Plan:

1. STC Project Management System:

The primary responsibility for managing project activities is vested in the STC Secretariat Executive Director. Overall monitoring will be performed annually by the Steering Committee, including assessing project progress towards the stated goal and purposes, program planning and performance of the Secretariat and assessing the budget. Annual progress reports will be prepared by the Secretariat summarizing project activities, achievement of objectives, problems and proposed resolutions. The reports will be submitted to USAID.

Direct activity monitoring will be conducted by the Secretariat staff, advisors and consultants through site visits. The visits will focus on analyzing subproject reports to ascertain activity progress and end-user involvement. The activities of the technical liaison agents will be evaluated, as will progress in the MIS. The Executive Director will prepare a report summarizing contractor and consultant progress, including tasks completed, anticipated actions, problems encountered and proposed evaluations.

2. USAID:

USAID monitoring activities will include: a) operating procedures including financial, procurement, contracting, subproject policies and others as appropriate; b) long-term training plans; c) annual subproject implementation or financial plans; d) the selection of specialized contractors or consultants to assist the Secretariat, e) compensation rates for incentive payments; and f) review of model contracts for short-term technical services and RD&E studies.

USAID's monitoring responsibility will focus on the Committee's compliance with policies and procedures as stated in project plans, and financial and progress reports. In addition to reports, the following will be used to monitor progress: periodic consultations with Committee and GOE officials; site visits; project baseline data; and evaluations. USAID's primary role will be ascertaining the effectiveness of the overall implementation process.

A checklist detailing monitoring responsibilities within USAID will be developed by the Project Officer.

H) Evaluation Plan:

The STC project is innovative. As such, it may need periodic readjusting of policies and procedures. Continuing internal evaluation of the STC will be required, as well as overall project evaluations. The internal evaluation process will be a continuing activity of the Project Secretariat and will include three elements:

- o Steering Committee semi-annual review of Secretariat performance, policies and procedures.
- o Secretariat semi-annual subproject review.
- o Internally conducted annual project evaluations.

External evaluations will be conducted in FY 91 and FY 94.

The annual internal evaluations by the Secretariat will assess project and subproject progress, serving as the basis for annual work plans and budgets and subsequent funding requests to USAID and MPIC. The evaluations will update and consolidate the information from semi-annual evaluations by the Secretariat and subproject principal investigators. The internal evaluations will focus on: 1) RD&E impact on local, regional, or national development problems; 2) interaction between the identified end-user and the researchers; 3) contributions of the end-user to subproject activities; 4) implementation of RD&E results; 5) effectiveness of linkages; 6) contributions of technical liaison agents; 7) progress in the IIS; 8) unresolved problems, operational procedures, constraints and issues; 9) cooperation and support by Governorate staff and councils; 10) effectiveness of the Secretariat in proposal solicitation, screening, RD&E project monitoring, support services, future planning, coordination among subprojects; and 11) future planning and direction.

The Steering Committee's Secretariat performance review will include the effectiveness of administrative policies and procedures, Secretariat staff performance, and functional support and services operations.

Baseline Survey:

In the initial implementation months, the Secretariat (through liaison agents and a selected university or institute) will conduct a baseline survey in the planned subproject areas to establish existing levels of activity. Each survey will include:

- o Number and scope of projects being conducted and researchers involved.
- o Extent of end-user involvement.
- o Availability and adequacy of research equipment.
- o Knowledge of and access to information systems.
- o Extent of cooperation among researchers, institutions and end-users.

The external evaluations in FY '91 and FY '94 will be conducted by U.S. and Egyptian consultants. Skill requirements will be in areas of S&T, industrial engineering, economic analysis, management and administration, and human resource development. Using the baseline data as a reference point, the evaluation teams will assess the following:

1. The effectiveness of technical inputs on solving socioeconomic problems in areas such as waste treatment, industrial minerals and chemicals, construction materials, small-scale industry, soil improvement, and other problem areas.
2. The extent to which interdisciplinary RD&E subprojects are an accepted and adopted approach.
3. The extent to which inclusion of social and economic inputs to research has become an accepted process.
4. The capability of regional universities to provide technical inputs for solving local and rural problems.
5. The capability of selected universities and research institutes to apply advanced technologies to industrial, agricultural and environmental problems.
6. The extent to which technical liaison activity supported by information services has contributed to new and better links among researchers and the productive sectors of the economy.
7. The extent to which results of RD&E have been adopted by end-users and have had a socioeconomic effect.

I. Implementation Schedule:

Major project events are summarized below. Annex N gives a schedule with responsible parties and timing indicated for each action.

<u>ACTIVITY</u>	<u>MONTH</u>
1. Project Paper Approved	May. 1987
2. Project Agreement signed, PIL issued	June 1987
3. CPs Met, Steering Committee established	Aug. 1987
4. Executive Director & System Contractor selected	Sep. 1987
5. RFPs for problem areas*, PSA issued	Jan. 1988
6. PSA contracted, information centers established*	Apr. 1988
7. Award of RD&E subprojects*	May. 1988
8. Commodities Procured*	Sep. 1988
9. Management Information System established	Sep. 1988
10. Continuous Grant Cycles*	Oct. 1988
11. New Information centers established, others enhanced*	Oct. 1988
12. Mid-Point Evaluation	Jan. 1992
13. Second Evaluation	July 1994
14. PACD	Sep. 1995

* Continuing activities

J. Requirements Precedent, Covenants and Negotiating Status:

The Grantee shall agree to cooperate fully with AID to accomplish the purpose of the Grant. To this end, it accepts the following requirements precedent and covenants.

1. Initial Disbursement:

Prior to disbursement for this project, or to the issuance by AID of documentation pursuant to which disbursement will be made, the Cooperating Country will, except as the parties may otherwise agree in writing, furnish to AID, in form and substance satisfactory to AID:

- a) Evidence of the establishment of a Steering Committee and Project Secretariat.
- b) A statement of the name of the person(s) on the Steering Committee and the Project Secretariat designated as authorized representatives on behalf of the Cooperating Country and of any additional representatives, together with specimen signatures of each person specified in such statement.
- c) Such other documentation as AID may reasonably require.*

2. Disbursement for Research Program Categories:

Prior to release of funds for the three research programs (national, regional/local, and advanced technology), the Cooperating Country will, except as the parties may otherwise agree in writing, furnish to AID, in form and substance satisfactory to AID, evidence that:

- a) All appropriate sets of regulations governing the administration of project funds, including incentives, have been formulated by the Cooperating Country in consultation with USAID to facilitate project implementation.
- b) The Project Secretariat has formulated financial, contractual and procurement arrangements acceptable to USAID.
- c) Such other documentation as AID may reasonably require.*

3. Additional Disbursement for RD&E Subprojects for Additional Problem Areas:

Prior to the release of funds for RD&E subprojects for additional problem areas other than those specified in the project description, the Cooperating

*Not to be included in the Project Authorization

Country shall furnish to AID, in form and substance satisfactory to AID:

- a) Evidence that the specific problem area meets the selection criteria set forth in the project description.
- b) Evidence that necessary funds are allocated to a specific problem area, with cost breakdown and disbursement projections over the life of each problem area activity.
- c) Such other documentation as AID may reasonably require.*

4. Additional Disbursement for Information Services:*

Prior to disbursement of the third scheduled incremental obligation by AID, the Cooperating Country, except as the parties may agree in writing, shall furnish in form and substance satisfactory to AID:

- a) Evidence that the Egyptian National Scientific and Technical Information Network (ENSTINET) has a separate GOE budget for its management and operation.
- b) Such other documentation as AID may reasonably require.*

II. Covenants:

The Cooperating Country agrees that:

- a) It will provide, on a timely basis, all local logistic support as may be required to ensure effective use of goods and services financed under the Grant.
- b) The Steering Committee and the Project Secretariat will meet formally with the AID project officer, at least semi-annually, to discuss major elements of project progress.
- c) It will cause the research organizations, involved ministries, governorates and universities to provide to the Project Secretariat and ENSTINET all necessary scientific and technology information, and technical and non-technical reports for computerization and establishment of appropriate data bases.*
- d) It will make concerted efforts to integrate S&T into the social and economic development plan of the GOE and increase and sustain its appropriateness for S&T RD&E activities.*

*Not to be included in the Project Authorization

e) The Grantee shall provide to AID the details of its counterpart contribution on request.

f) Research subgrants will be awarded on a competitive basis.*

Negotiation Status:

There has been continuous exchange with the Academy of Scientific Research and Technology in preparing this project paper. ASRT is in agreement with the project elements as presented herein.

not to be included in the Project Authorization.

ANNEXES

SCIENCE AND TECHNOLOGY COOPERATION
(263-0140.1)
Egypt

PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

Annex A
 Life of Project: FY 87 - FY 94
 Total U.S. Funding \$36.0 million
 Date Prepared 02/04/87

Project Title and Number: Science and Technology Cooperation (263-0140.1)

NARRATIVE SUMMARY	OBJECTIVELY VARIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><u>Program or Sector Goal:</u></p> <p>To improve the productivity and welfare of the Egyptian people through the application of technology to specific development problems.</p>	<p><u>Measures of Goal Achievement:</u> <u>Targets</u></p> <ul style="list-style-type: none"> - Socio economic solutions to specific number of development problems. - Finances available for the implementation of cost effective solutions. - Economic and social benefits accrued from the adoption of technologies. 	<p><u>Assumption for achieving goal</u></p> <ul style="list-style-type: none"> - Examination of research activities requested by end users. - Examination of problems resolved and their impact on socio-economic development. - Project evaluations. - Records of technology transferred. 	<ul style="list-style-type: none"> - Political Stability. - Proper technology applications will improve productivity and welfare in Egypt. - Events external to the project do not obscure project efforts. - Information generated by the project is disseminated and acted upon.
<p><u>Project Purpose:</u></p> <p>The purpose is to redirect Egyptian S&T programs to help solve priority development problems identified as having greatest impact on end users and to build S&T capacities in selected technologies.</p>	<p><u>End of project Status:</u></p> <ol style="list-style-type: none"> 1. Technical inputs provided to socioeconomic problems in areas such as waste treatment, industrial minerals and chemicals, construction materials, small-scale industry, soil analysis as well as other areas yet to be identified. 2. Multidisciplinary S&T projects directed to national and local development problems are accepted as a standard GOE approach. 3. Institutionalization of S&T RD&E inputs and assessments for Egyptian industrial development. 4. The inclusion of timely social and economic inputs to developmental research will be an accepted process. 5. The regional universities will be capable of providing technical inputs for the solution of local and rural problems. 6. Selected universities and research institutes will be capable of applying advanced technologies to industrial, agricultural and environmental problems. 7. Better links between researchers and the productive sectors of the economy will be established through the use of an automated information system. 8. Management Information System is established. 	<ul style="list-style-type: none"> - Baseline survey by the project secretariat. - Reports prepared by the project secretariat. - Special studies and interviews with policy decision makers and end users. - Interim evaluation. - Final evaluation. 	<p><u>Assumptions for achieving purposes:</u></p> <ul style="list-style-type: none"> - Priority problem areas are preselected with strict application of criteria. - End users are directly involved in problem definition and testing of RD&E results. - S&T community motivated to solve development problems by provision of monetary compensation competitive with consulting industrial firms.

Outputs:

1. National RD&E programs.
2. Local/Regional RD&E programs.
3. Advanced technology programs in Biotechnology & Computer Based Technology.
4. Supporting services:
 - a. Egyptian Management Services
 - b. Information Services
 - c. Technical Support Services

Magnitude of Outputs:

1. 10-14 Research subprojects completed for national programs in construction materials, industrial minerals and chemicals, soil analysis and characterization, and for other problem areas to be defined later.
2. 12-19 Research subprojects completed for local/national RD&E programs in lake ecosystems, small scale industries water and wastewater treatment etc.
3. a. 7-9 Research subprojects completed for biotechnology application in agricultural crops and industrial fermentation.
3. b. 6-10 Research subprojects completed for computer based application for process control for electric power grid and metals industry and internal requiremental control for food packaging and processing.
4. a. 2-4 Industrial liaison agents established at the governorates.
4. b. 4-6 Information centers established at the local universities and linked to the Egyptian National Scientific & Technical Information Network.
4. c. Establishment of organization procedures and guidelines for the project secretariat and related committees.

- Project Progress Reports.
- Regular project monitoring.
- Special studies and regular evaluation.
- Official and unofficial project records.
- Project Secretariat Reports.

Assumptions for achieving outputs:

- GOE ensures the autonomy of the SC and encourage end-users' participation.
- Local authorities willing to participate actively and cooperatively.
- Research institutions and universities willing to cooperate and respond to RFPs in a multi-disciplinary interinstitutional approach.
- Suitable problem areas in RD&E projects can be identified.
- Awards are made on a competitive basis.

Inputs:

1. Research Contracts:
 - A. National Research Programs
 - B. Local Research Programs
 - C. Biotechnology Program
 - D. Computer based Technology Program
2. Equipment
3. U.S. Participant Training
4. Egyptian Management Services
5. Information Services
6. Technical Support Services

Implementation Target:

	\$6.54 million (10-14 subprojects)
	\$6.53 million (12-19 subprojects)
	\$2.9 million (6-10 subprojects)
	\$2.8 million (6-10 subprojects)
	\$9.51 million (200-300 items)
	\$1.015 million (250 mm)
	\$2.38 million (70 my)
	\$2.505 million
	\$1.85 million
	<u>\$36.0 million</u> TOTAL

- Project Grant Agreement.
- Project Accounts.
- Specialized Reports.
- Accounting Records.

Assumptions for providing inputs:

- End-users willing to participate in cost sharing activities.
- Egyptian compensations are competitive with consulting and industrial firms.
- Universities & Research centers willing to provide human resources
- Project Secretariat can recruit staff and technical liaison officers.

S&T Projects

Since the resumption of U.S. technical assistance to Egypt, AID support for Egyptian S&T has progressed through two distinct but interrelated stages of cooperation:

- Stage I (1976-1980), the "Initiation Stage", was essentially a large capacity building program aimed at strengthening individual researchers' ability to contribute to national development. Training and research support was funded by three projects during this phase: a) the Applied S&T project with the ASRF (\$ 24.1 million); b) the Development Planning Studies at Cairo Univ. (\$ 22.8 million); and c) the Technical Transfer and Manpower Development Project (\$ 34.5 million).
- Stage II (1980-1986), the "Engagement Stage", continued capacity building of university and institute researchers to further institutionalize the concept of problem solving and establish links with technology users. The main emphasis was still institution building but a wider variety of practical problems were addressed. Some Stage I projects were extended with added funding and four new projects were initiated: a) University Linkages (\$ 27.2 million); b) the Peace Fellowship Program (\$ 54 million); which complemented Stage I projects, c) Industrial Productivity Improvement (\$ 39 million) which aimed at strengthening the application of scientific management and innovative technologies in public and private companies; and d) the Mineral, Petroleum and Groundwater Assessment Program (\$ 29.7 million) which provides information on potential investment opportunities utilizing Egyptian natural resources.

The Stage I and II projects produced substantial achievements in capacity building and problem solving capabilities. Recognition of this was reflected in the increasing number of GOE requests to universities and research institutes to address questions concerning public policy and technological development. Most notably President Mubarak and the Prime Minister made three separate requests involving 15 individual issues. Several Governors expressed the need for technical information and advice in conducting their official affairs. USAID also has increasingly recognized S&T as an important element of its strategy for cooperation with the Egyptian Government.

In spite of the many and varied development problems facing Egypt and the steadily increasing capacity of the S&T community, technology is not being effectively used in resolving these problems. There is still a wide gap between end-users - the potential consumers of technology, and the suppliers - scientists and research workers. There is limited understanding of the necessary linkage between research, technical development and engineering. The importance of socioeconomic and technoeconomic studies in ensuring the successful adoption

of research results is not fully understood. -- Researchers have only...
battlingly address matters of public acceptance and financial return. Further,
institutional and procedural barriers restrict interinstitutional and
interdisciplinary approaches to the complex issues of economic and social
development. Lastly, existing academic practices for personal advancement do
not motivate researchers to undertake the needed applied research, technical
development and engineering.

The S&T Technical Assistance Needs

SIC in Stage III, (1986-1993), the "Commitment Stage", builds on the lessons
learned and the achievements of Stages I and II, and will provide:

- A focus on a limited number of well-defined development problems for which
goals can be identified, approaches and inputs can be monitored and
mechanisms to encourage technology adoption are ensured;
- Measures involving the end-user in problem definition, in evaluating and
testing technical outputs and in implementing solutions. These measures
will require a commitment of time and, to the degree possible, resources
of the end-user to ensure active participation;
- Encouragement and reward for interdisciplinary, collaborative efforts to
solving national, regional and local problems;
- Support for analyzing social and economic factors important to accepting
and adopting technological inputs for improving productivity and quality
of life;
- Assistance for regional universities and research institutes to undertake
an interinstitutional problem solving approach appropriate to their
socioeconomic setting; and
- establishing communication channels to increase the frequency and
effectiveness of interchange among researchers and end-users.

The sum total of these actions would change, in a significant and lasting
manner, the role of S&T in Egyptian development. The need for these changes
is evidenced by expressed desires, at the national and local levels, for
technical assistance.

1) R&D Capacity: Top GOE officials lack a full appreciation of the need for a strong and effective R&D program.

GOE officials are willing to support applied research only if it meets end-users needs and if research results lead to practical application. R&D efforts in the STC component will demand driven and specifically responsive to problems and opportunities of direct interest to industry and agriculture. In addition, the STC design applies research results into a pilot stage after detailed techno-socio-economic analyses are performed. As a result, end-users can immediately appreciate positive effects of R&D efforts. The application of research results to on-site problems will be a main criteria for success of the STC component.

2) Policy Dialogue: The ASRT must take initiatives to improve the S&T policy framework and to coordinate and galvanize government, academic and public/private sector resources.

The STC component structure provides for policy dialogue with a focus on specific policy constraints and alternate views of addressing these constraints. Several mechanisms for enhancing policy dialogue are described in Section III.C.

The composition of the Steering Committee includes senior government officials, academics, governors and private sector representatives. Its composition and the proposed method of operation will promote policy discussion and coordination by the ASRT, which will be represented by the Minister of Scientific Research and the ASRT President.

3) Institutional Development and Problem Solving: In designing the STC, the balance between institution building and problem solving research was found to be weighted towards the latter. This may hamper the institutionalization of a "system" of S&T research while concentrating on narrower problem solving objectives.

For the past decade USAID/Cairo invested its major S&T efforts towards institutional development. This has often characterized the achievements obtained from research results, but created skepticism among top GOE officials regarding research payback. Experiences in other developing countries, such as Korea, suggests that the highest productivity occurs at the adaptation end of the S&T scale, i.e., where technology is developed in-country or imported into developing countries and adapted to local conditions. This is the approach being taken in the STC component. There are two areas, however, where STC will purposely continue institution building:

Local research program; many local research groups will be recipients of research funding. For some the funding and applied research approach will be new. In these cases, capacity building and technology transfer will be emphasized along with applicable research results. These efforts will enable the local groups to become more effective as a future research resource.

Biotechnology; a relatively new and vital area for Egypt's S&T community. Because of very limited current capacity in this area, we will have to emphasize institution building as well as problem solving. The capacity developed in STC funded research efforts will yield high returns in future efforts.

There will be trade-offs during implementation when deciding to use project resources to strengthen the "newer" research institutions to conduct systematic RD&E, or to solving specific problems having near-term potential and application.

4) Problem Area Selection: There is a need for additional analytical work to develop further the research subprojects under identified problem areas. Time is also required for identifying new problem areas and their subprojects. This may require a longer time frame than usually employed to achieve project objectives.

The STC component contains criteria and procedures for problem area selection which are described in Section III.E.1.b, and an initial set of eleven problem areas have been identified (see section III.2). Under the USAID support services and the Project Secretariat, U.S. and local consultants will identify research subprojects in identified problem areas and assist in preparing RFP's.

A series of measures were taken to accommodate the time frame for identifying research subprojects and new problem areas. For subprojects:

- 1) Soon after approving of the Project Paper, USAID will contract a consultant to help identify research subprojects under the identified problem areas and prepare the necessary RFP's.
- 2) One of the main functions of the technical liaison office is assisting governorates and end-users in identifying new problem areas on a semi-annual basis. The process of identifying subprojects will be continuous.
- 3) The management plan calls for a one year period for planning and start up activities (RFP, call for proposals, contract award), and four-to-five years for research implementation.

Because of the time needed for appropriate problem and subproject identification, the STC component will be an eight year project.

The same approach will be taken in identifying new problem areas.

5) Coordination: The institutional arrangement calls for coordinating a range of Egyptian institutes with a record of limited success in coordination.

The organizational structure of the Steering Committee and Project Secretariat, together with other measures contemplated in the STC (such as establishing technical liaison agents, competitive research, organizing workshops and seminars, and using local universities as research leaders) are responsive to this concern. The multi-institutional Steering Committee and Project Secretariat will ensure component coordination at the policy and management levels. The Secretariat will provide effective project coordination at the operational level.

The STC mechanism is designed to "manage" activities by facilitating interaction among various elements interested in solving similar problems. Moreover, project implementation is designed to ensure effective use of resources by encouraging constructive interaction between the research community and the end-users.

6) In previous AID or CDE S&T projects limited efforts were made to determine whether research results were applied and transmitted to industry/agriculture for practical applications.

There is a need to collect and synthesize information already generated for a specific critical problem area, and relay the research results to the productive sector. Such functions cannot be performed solely by researchers or by end-users. A "broker" between the scientists and the needs of the industrialist is highly desirable. As part of the Project Secretariat's activities, technical liaison agents will bridge the gap between researchers and end-users in the industrial and agricultural sectors and the different governorates. Moreover, the component will provide Scientific and Technical Information (STI) services so that researchers will have adequate information regarding related research completed or underway in Egypt or other countries.

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Problem Area Descriptions

Introduction:

The project design categorizes RD&E to be undertaken in the STC component as follows:

- a) Local and regional research programs;
- b) National research program;
- c) Advanced technology research program.

The component design process included visits to seven regions of Egypt to discuss development needs and priorities with regional officials, local university staff and local industries. Meetings were also held with research institutes, universities, government agencies, industries, AID offices and projects, and individual scientists and engineers in the Greater Cairo area. A seminar was held to discuss trends in biotechnology, local skills and problems that could be addressed with the addition of greater capacity and coordination. In addition, several members of the Design Team worked on the 18 month S&T Assessment which was completed in 1984.

The purpose of these consultations was to establish priority problem areas which would form the basis for sub-project design and initial STC proposal solicitation and award.

It became clear during the design process, however, that some of the problem areas identified (e.g., waste water treatment, construction materials, industrial chemicals and minerals) have both local or regional as well as national dimensions. This clearly indicated the need for a multi-institutional, inter-disciplinary approach to be used in finding appropriate solutions to identified problem areas and to problem areas which will be further delineated during the LOP.

Further, the design process indicated the need for establishing an STC Data Base as a component of the Project, in order to assure the fullest extent of information sharing between similar sub-projects, and between local, regional, or national problem areas.

1 Regional and Local Problems Research Programs:

A. Improving Lake Ecosystems:

There are five lakes on the northern coast where the Egyptian Delta meets the Mediterranean; Mariut, Edku, Borollos, Manzala and Bardaweil. There is also a chain of lakes in the Suez Canal waterway of which Eltemsah and Elmorra are

~~the more important. These are saline lakes with economic outputs from fish production and/or recreational use. Only one of these lakes, Bardawil, is relatively free of pollution. The governorates in which these lakes are located have expressed concern about declining fish catches and about their desire to increase income from recreational use.~~

While statistics on the annual catches of private fishermen are unreliable rough estimates have been made; Lake Manzala - 45,000 tons, Lake Borollos - 25,000 tons, Lake Mariut - 10,000 tons and Lake Edku - 3,000 tons. Estimates for Eltemsah and Elmorro are not available but it is known that fish from these lakes, especially Eltemsah, command significantly higher market prices because of their quality. These latter two lakes also have major recreational use.

The ecologies and pollution levels of these lakes differ. The canal waterway lakes have water inputs both from the Mediterranean and the Red Sea. They are subject to oil pollution and, to a lesser extent, pollution from cities and industrial activities along the Suez Canal, but can be considered biologically clean at the moment. The Mediterranean coastal lakes range from Mariut, which receives heavy pollution from Alexandria District, to Borollos and Manzala which are being affected by agricultural drainage canals containing sewage and industrial wastewaters from upstream. These lakes are also influenced by increasing reclamation of marginally productive shorelands.

Studies of Lake Mariut water quality were carried out and baseline data obtained approximately ten years ago by the Higher Institute of Public Health in Alexandria. In 1972, the Ford Foundation began, a study of semi-arid habitats, including areas around Lake Mariut. This study continues through the efforts of the University of Alexandria. The city of Alexandria has for some time considered alternatives to its municipal waste discharge patterns but continues to dump wastes in the Mediterranean near the lake and directly in the lake. In addition, large amounts of industrial waste effluents enter Lake Mariut.

There have been no inter-disciplinary studies which treat each lake and the adjacent lands as an ecosystem. Nor has there been integration of lake concerns with regional development plans for the growing Alexandria metropolitan area being carried out for the Governor's office by the Universities of Alexandria and Liverpool. A team, including analytical chemists, marine biologists, fishery specialists, hydrologists, geophysicists, mathematical modelers, ecologists and land use planners, will be organized to carry out sampling, analysis and studies to characterize four lakes. Cooperation between local universities and institutions will be required in the project design.

The subproject objective is to generate recommendations for the best economic use of lake resources and prioritized steps to slow or halt the most serious forms of pollution. A further objective is to begin redressing, at least partially, ecological degradation.

B. Small-scale Industries:

Small-scale industries were selected because of efforts by local governorates to increase the productivity of existing enterprises and to expand the base of non-polluting, small-and medium-size-private industries.

Four studies characterizing Egyptian small-to medium-scale enterprises were carried out in the period 1982-84. The first, undertaken for AID by A. D. Little Internacional, focused on firms with 10 to 200 employees and less than LE 300,00 of fixed assets (excluding land and buildings) located in Cairo and Alexandria. A second, by Checci and Co. with World Bank financing was confined to producers with less than 50 workers in Greater Cairo, Alexandria, Assuit and Damietta governorates. Another study of small enterprises (1 to 5 workers average) was carried out by a team from Michigan State University, Zagazig University and Cairo University (Fayoum) in the governorates of Fayoum and Kalubia. Makers of dairy products (butter and cheese) were dominant, comprising more than 50% of the small-scale activity in both governorates. Textiles, broadly defined, were second with over 40% of the employment. A fourth study by the National Research Center under the AID sponsored More and Better Foods project considered existing and new products/processes for village and household level food industries. Despite these studies, little is being done to provide technical assistance to increase the productivity of these industries.

A relatively new social trend also suggests the need for small-scale industry assistance. As a result of changing regional economies, Egyptian expatriate laborers are returning in increasing numbers, but not to the farms which they left. They possess small amounts of capital and show a preference for entering into commerce and transport ventures rather than farming. The opportunity exists to channel a part of this capacity to productive, small-scale manufacturing firms.

One of many examples of a small-scale enterprise opportunities is the furniture/carpentry industry in the Damietta Governorate. This industry employs about 55,000 workers and annually manufactures products valued at LE 300 million for domestic markets and export to Arabic countries. Virtually no penetration of European markets has been made largely because of furniture st les and construction.

Opening of the Damietta Port will reduce the cost of imported woods used by the industry and now trucked from Alexandria. Relocation of some furniture manufacturing to an industrial free-zone at the port would reduce costs substantially, given the 50% duty now paid on wood. Assistance with foreign marketing, product design, manufacturing standards for reassembly of components, tooling and the socioeconomic aspects of relocation are needed to successfully access new export markets.

Other small industry sectors include dairy product processing, building materials and leather. STC will, through pre-subproject studies, identify and

define a series of small-scale industry opportunities to be funded throughout the LOP.

C. Water and Wastewater Treatment:

The problems of potable water supply and wastewater treatment are closely related in Egypt. It is estimated that 60% of potable water is currently derived from surface water sources. Ground water, in some areas, contains unacceptable levels of iron and manganese while, in other areas, salinity is increasing. Future potable water will rely even more heavily on surface waters.

Population pressures and industrialization are causing ever greater pollution loading on the surface water system and, in the absence of adequate waste water treatment facilities, the locus of the pollution is transferred to downstream communities. Waste disposal by dilution in fresh water cannot be tolerated much longer, especially in side canals.

Law No. 48/1982 requires adoption of wastewater treatment to reduce pollution from point sources including industrial sites. Implementation has not been rapid because water and sewage treatment systems are capital intensive, require permanent construction and forward planning. AID and other donors are assisting in constructing urban treatment plants and in designing and testing village scale wastewater treatment systems. The outlook is not optimistic, however.

Existing treatment plants are not functioning efficiently and at their rated capacities. Many communities are without wastewater treatment and several Governorates are seeking advice and help in their efforts to address a critical problem effecting villages, municipalities and rural households.

Most governorates lack trained people with experience to advise on selecting of treatment technologies and inform authorities on the reasons for malfunctioning or underperformance of many existing water and wastewater treatment plants. The required scientific and engineering skills do exist in some of the regional universities. A program of training in the special needs of potable water and wastewater analysis coupled with weekly visits to treatment plants for familiarization, sampling and analysis can create the capability to perform plant surveys with recommendations for corrective actions. Surveys would be done with participation by plant personnel and NOPWSD would contribute to the subproject overview.

Two-and-one-half years of on-the-job training can create an effective manpower resource and complete surveys of at least 16 water and wastewater treatment plants. However, to be truly effective, this effort must involve the governorates from the beginning. The Governors' offices will ensure access to the treatment facilities and, most importantly, take decisions and action based upon the survey reports. An active relationship between the teams and the offices of the Governors will be an effective mechanism in promoting continued use of the capability beyond the end of the subproject.

2. National Problems Research Program:

(A) Soil Characterization:

Insufficient data on agricultural soil and irrigation water is a problem of national concern, having regional and local importance as well. Accurate information about soil characteristics, subsoil water quality and irrigation water quality is a prerequisite to better crop selection and rotation, to improved irrigation practices and to land use planning. Systematic sampling and analysis have not been performed in over twenty years. Following construction of the High Dam, the quality and regime of irrigation waters have undergone major changes. This is certain to have altered soil characteristics as well.

Nile water deposition on cultivated lands prior to the dam was approximately 5.7 tons per feddan. This included an average clay fraction of 2.1 tons, 235 kg of organic matter, 40 kg of potassium, 7.2 kg of nitrogen, 40 kg of phosphorous, 9 kg of manganese, 108 kg of zinc and 1.8 kg of copper. This natural fertilization ceased 23 years ago and has been replaced, in varying degrees, by chemical fertilizers. In this same period, the basin irrigation employed in the southern Nile valley has been replaced by perennial irrigation. Reclamation of desert lands also has been carried out during this period and continues at an accelerated pace.

As a result, the updating and expansion of information on soil and water characteristics to provide current baseline data for both alluvial and reclaimed lands has become an urgent need. STC will undertake the design and implementation of a soil/water sampling and analysis subproject. The section below suggests the scale of the problem and some alternatives to be considered in a project design effort.

The cultivated alluvial land in Egypt amounts to 5.1 million feddans. In addition, there are approximately 1 million feddans of newly reclaimed land. For sampling designation purposes, the entire lands of interest can be divided into 10 zones with more or less homogeneous soil characteristics within each zone. These zones are as follows:

- | | |
|--------------------------|--------------------|
| 1. Upper Egypt to Assuit | 6. North Delta |
| 2. The New Valley | 7. West Delta |
| 3. North Valley to Giza | 8. Northwest Coast |
| 4. South Delta | 9. East Delta |
| 5. Mid-Delta | 10. Sinai |

Assuming a sampling frequency of one sample for each 25 feddans of alluvial soil and one sample per 100 feddans of newly reclaimed land, the total number of samples required to "map" all of Egypt's arable and potentially arable land would be 214,000. Regional analysis laboratories will need to be established at existing institutions. These should be full-time activities equipped and staffed to perform the required sample collection and analysis. A "capacity"

for 35 samples per day might be typical.

Characterization of alluvial soils should include:

Hydrophysical Properties

- Mechanical Analysis
- Water Retention capacity
- Infiltration Rate
- Permeability
- Water Table Level
- Sample Site Drainage System Efficiency

Chemical Properties

- pH
- Electrical Conductivity
- Calcium Carbonate Content
- Plant Minerals Content
- Ground Water Quality
- Drainage Water Quality

Biological Properties

- Bacterial Count
- Nitrogen Fixers Identification and Count
- Soil and Plant Diseases
- Fungi Identification

Characterization of reclaimed land should include:

Pedological Features

- Soil Profile
- Hard Pan
- Gypsum Content, and
- Hydrophysical and Chemical Properties as before.

Standard analytical and statistical procedures together with adequate control need to be employed to assure intercomparability among the analyses of different laboratories. Procedures which meet international standards would be desirable.

It is possible to begin the survey at selected regional locations, provided that a mixture of alluvial soils and reclaimed lands are included. This is desirable to establish baseline data for each soil category and to clarify special analysis problems for each soil regime. The detailed subproject design will address questions of the number of centers, their location, staffing and workload. The data acquired in this effort can be used long after the project. The experience gained in conducting an integrated and standardized analysis effort will help assure the ability to continue soil testing beyond the LOP. The data obtained can contribute to agricultural productivity through: improved fertilizer design (nitrogen form and content, phosphorous content and micronutrients), quantified needs for soil

conditioning; better understanding of the distribution of plant diseases; and quantification of other constraints such as water quality. The data will help to understand soil changes that have taken place and likely future trends. Land use planning for both alluvial and reclaimed areas will be improved with the availability of soil/water "maps".

(B) Construction Bricks:

In Egypt, the clay brick industry, which is predominantly private sector, has depended on the Nile silt as a basic raw material. As a result of the construction of the High Dam in 1965, annual silt deposits along the Nile were eliminated, which forced the small brick factories to exploit the fertile soil of the cultivated lands for brickmaking. This situation posed a serious threat to the national agricultural wealth and the Government issued a law in August 1985 banning further use of agricultural soil for brick-making.

The consequence of this law has been that approximately 1200 small private brick factories (40% in Giza) have been forced to suspend manufacturing operations, resulting in the loss of approximately 72,000 jobs, plus an unknown number of jobs in the construction and related industries. These 1200 factories produced about 4.5 billion bricks annually (64.5%) of the estimated 7 billion bricks used in construction in 1985, with the balance of construction needs met by different substitutes such as desert clay bricks, sand lime bricks, gypsum blocks and cement blocks. Concrete blocks have not proven to be satisfactory, because of poor quality, excessive use of imported cement in their manufacture and waste of mortar for construction. Processes for sand lime bricks and gypsum bricks are confronted with as yet unsolved problems. Approximately 750 million desert clay bricks are being produced annually, usually using poor manufacturing processes.

The Egyptian population, currently 50 million, is growing at the rate of 1 million people every 9 months. Increased housing is an immediate and urgent need. It is estimated that consumption of construction bricks will reach 10 billion/year by 1990 and 15 billion/year by 2000. This increased demand and the constraints imposed by the law banning use of Nile silt, means that annual brick production will fall far short of annual demand by approximately 4.5 billion bricks/year, unless other raw materials can be used.

Substitutes for Nile silt, with varying regional availability, include desert clays, gypsum, bentonites, and lime (for sand-lime bricks). Preliminary field work, laboratory evaluation, and pilot testing of the feasibility of using these raw materials as substitutes for Nile silt, has been favorable. It appears that desert clays for brick-making are most promising, although other substitutes need investigation also, particularly in view of varying regional availability of raw materials and local brick demand. For example, a rather extensive study showed that the clay deposits in Benisuef cover an area of 3 km, with estimates of 22 - 33 m deep. This is sufficient to manufacture 10-18 billion bricks, i.e., to supply a brick factory, with a capacity of 100 million bricks/year, with raw material for over 100 years. Other studies have shown similar capacity in Sohag. Although the USAID-funded Mineral Resources

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and Petroleum Project is currently surveying these and other resources; project reports indicate that the definition of clay deposits is far from complete.

There are a number of problems confronting the use of desert clays for brick-making, which have not really been resolved. These are:

- o The desert clays are predominately the Montmorillonitic type, and characterization for use under Egyptian manufacturing conditions is incomplete. Studies that have been completed are at least 8-10 years old.
- o Inappropriate technology has been transferred to Egypt, which has not taken into consideration such factors as local raw materials use, availability of skilled labor, available processing equipment and actual production rates attainable;
- o Desert clays demonstrate high plasticity coefficients which require a considerable addition of sand to achieve desired physical and mechanical properties. This creates abrasion and equipment breakdown problems in the manufacturing process;
- o The high acidic content of the clays leads to corrosion problems in manufacturing;
- o Most Egyptian studies of desert clays and their use in brick-making have been limited to laboratory scale investigations. This has overlooked many important technical and engineering variables which are of prime importance for commercial production of bricks from desert clays.

Similar problems exist in producing sand-lime bricks and gypsum bricks. Each of these brick types suffer from considerable water absorption properties and subsequent degradation, thus polymeric or other additives must be investigated to prevent degradation and loss of mechanical strength. Furthermore, sand-lime bricks require extensive quality control throughout the manufacturing process which is beyond the capabilities of most small brick producers.

Because of the urgent need to meet current brick consumption, and to meet future increased demand, the SIC will fund a series of subprojects to resolve the engineering parameters of brick-making from alternate materials. Consideration will be given to subprojects which can relate required RD&E to locally available and variable raw material resources and to local construction demands.

Three major areas of RD&E will be undertaken. These are:

- o Laboratory investigations including sampling, chemical analysis (to determine that chemical composition of the raw material is in the

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desired range) and physical analysis (specific gravity, specific volume, particle size distribution and plasticity);

- o Pilot Plant investigation including raw material preparation (washing, grinding, sieving, drying), suitable additions (sand or bentonite to desert clay, polymers or other additives to lime-sand and gypsum brick), plasticity of product as a function of water used, brick shaping, brick pre-drying, brick burning, other process factors to determine brick shrinkage, density, water retention, porosity, and stress resistance;
- o Economics of production including transportation and mining costs, establishing new factories based on use of locally available material, retrofitting existing factories to optimize use of available equipment and human resources and requirements to convert to alternate raw materials.

The sub-projects will relate to the following:

- o raw material should be close to the brick consumption market with adequate transportation;
- o deposits of raw material should be adequate for long-term production to encourage construction of a new plant or retrofitting an existing plant;
- o establishing the economic and technical feasibility of using the raw material in brick-making.

It should be noted that EGSMA has completed survey and analytical "packages" on clay, gypsum and lime resources.

(C) Industrial Chemicals and Minerals:

A significant amount of industrial chemicals and minerals are currently imported, for industrial processing; estimated at 294,000 tons/year at a cost of LE 160 million. At the same time, Egyptian entities such as the Egyptian Geological Survey and Mining Authority (EGSMA), the Public Sector of Mining and Refractory Industries (MARIC), the Public Sector Authority for Chemical Industries, the National Research Center (NRC), and the Central Metallurgical Research and Development Institute (CMRDI), have indicated that proven reserves of Egyptian raw materials can be exploited for producing industrial chemicals and/or value-added minerals processing, thus reducing expenditures of scarce foreign currency.

The following guidelines will influence the design of subproject contracts/grants for this problem area:

- o ~~Petroleum and petrochemical products, fertilizers, pulp and paper~~ products should be excluded because these are reserved for the public sector and special concessions;
- o The products should have export potential;
- o The products should have potential to reduce or eliminate imported raw materials or finished products;
- o The products should be used directly to satisfy human needs or are to be used in the manufacture of such products.

The target group for this RD&E is private sector industries which sell their products to private or public sector industries and entrepreneurs who will initiate new industries. It is important in conducting RD&E in this area to recognize that end-user's require a continuous supply of the material to be produced or processed, with an assured quality for marketability. While some laboratory investigation may be necessary, the major focus will be pilot or demonstration plant operations, techno-economic and market feasibility studies. A few examples, which will help to delineate the problem area are described briefly below. Because of the importance of this problem area to the economic development of Egypt, more detailed and continuing definitions will be required.

Egypt imports over 1,400 tons of titanium oxide annually at a cost of LE 940,000 (1984 data) for use as a pigment in paints, varnish and lacquers, in the paper industry, and in rubber, linoleum, leather and textile industries. Egypt also imports ferro-titanium and ferro-vanadium alloys for steel-making. Iron-titanium containing Ilmenite ore deposits on the Western Coast of the Red Sea are reported to amount to 45 million tons of ore containing 40% titanium oxide. This deposit can be exploited to produce titanium oxide, ferro-titanium and ferro-vanadium alloys, for local use and/or production of vanadium oxide and other rare elements as an export commodity. Some laboratory tests (MARIC) and the geological survey report (EGSMA) are available. Mineral beneficiation and pilot studies for extraction of titanium oxide by treatment with sulfuric acid are required, as well as economic and market feasibility studies.

Proven reserves of celestite (strontium ore) in Wadi Esel are in the order of 2 million tons, with probable additional reserves of approximately 4 million tons. It has been shown that celestite can be beneficiated easily to be used as a drilling mud substitute for barite (Egypt expends LE 2.5 million/year importing 36,000 tons of barite for this purpose). Alternatively, the mineral can be further processed to produce strontium sulfate, which is used as a coating for T.V. screens, as a filter for secondary x-rays, and as a paint filler. This market is estimated to require about 20 thousand tons/year. RD&E needed involves: beneficiation studies to quantify celestite as a substitute for imported barite; beneficiation and an extraction process for recovering strontium sulfate of a quality suitable for the above-referenced

uses; and techno-economic and market feasibility studies.

Preliminary tests (Applied S&T Project) show that activated bentonite can measurably improve the physical and mechanical properties of foundry sands, thus improving the quality and productivity of iron and steel castings. Potential end-users are the El Nasr Casting Co., the Helwan Casting Co., and numerous smaller, privately owned foundries. It appears that these foundries may be interested in jointly financing accompany to process bentonite for foundry use, if a technically and economically feasible process can be established. Initially, the preliminary tests of the CERDI need to be further refined and expanded through the pilot plant stage, including on-site foundry production runs. This will test and demonstrate the technical and economic feasibility of using activated bentonite additions to foundry sands.

Three specific by-product chemicals have been identified in Assuit which can be effectively used in Egypt, and have the beneficial effect of reducing environmental pollution. These are:

- o Production of 12,000 tons/year of alum by reaction of surplus sulfuric acid on aluminum slag at the Mankabad phosphate fertilizer plant. The alum is currently discarded. End-user: EGYPTALUM and water treatment plants in area;
- o Recovery of valuable sodium fluoride and calcium fluoride salts from scrapped cathode linings at EGYPTALUM and sodium and calcium fluorilicates which are currently discharged into the Nile. End-users: EGYPTALUM and other chemicals industries,
- o Production of aluminum-silicon alloys and aluminum fluoride salts by using salts listed above and aluminum slag. End-users: EGYPTALUM, aluminum foundries, iron and steel works.

3. Advanced Technology:

A. Biotechnology, while developing the capabilities of selected research groups. Initial problems have been selected which will allow the application of new but intermediately sophisticated techniques. In the first area, crop productivity improvement, the main focus will be on crops for semi-arid lands with the dual objective of increasing crop productivity and providing soil enrichment. In the second area, fermentation processing, new techniques will be applied to the production of (a) non-conventional animal feeds from agricultural and food processing wastes, and (b) the treatment of industrial wastes.

1. Crops for Semi-Arid Lands:

a) Increased Productivity of Vicia Faba (Broad Beans):

The legume crop Vicia Faba provides the basic dietary component and a major source of protein in the Egyptian diet. It is also capable of fixing its own

nitrogen, essential for plant growth, by forming a symbiotic relationship with the soil bacteria Rhizobium. These bacteria manufacture the nitrogen - fixing enzyme nitrogenase, which provides two thirds of all nitrogen fixed in the plant. In addition to their food value, legume-based cropping systems serve the dual purpose of building soil quality through sequential cropping, interplanting, and winter ground cover.

Problems with soil characteristics (e.g., acidity, nutrient level) and indigenous rhizobia which do not fix nitrogen limit the use of the crop, particularly in reclaimed lands, substantially increasing fertilizer needs. Although symbiotic systems have been developed in laboratories, successful transfer to the field has been limited. Improvements in varieties for Egypt will be developed through pot studies/greenhouse cultivation, and regional field studies using selected vicia faba cultures and Rhizobium strains. Activities include:

- nodulation and nitrogen fixing efficiency
- development of in vitro cell-culture, callus culture, and plant regeneration systems and techniques for varietal finger printing
- in vitro screening for environmental stress tolerance and resistance (eg., pathogens, toxin, salinity)
- embryo culture approaches to interspecific hybridization for increased insect resistance
- pollen-haploid culture to produce instantly homogeneous breed lines

At an appropriate point (i.e., after sufficient training and facilities improvement), this is an ideal crop for application of recombinant DNA techniques for enhancing protein storage.

The national soil characterization subproject will provide important background information for this subproject.

b. Clover (Berseem) Yield Improvement:

This legume crop is used mainly as animal fodder and also possesses nitrogen fixation mechanisms which enrich the soil. As discussed under fermentation processes for non-conventioned animal feeds there is a major need for both increasing the nutrition of indigenous animals and their production. Improvements in this crop will follow the same procedures as for vicia faba above and can be done in parallel, with major savings in facilities and personnel.

c. Development of Date Palms Tissue Culturing and Regeneration Techniques

Dates are an important crop, frequently in insufficient supply in Egypt, which have very high nutritive value, allow processing in a variety of ways for

marketing and have excellent potential for export. After the initial growth stage, palm trees reasonably tolerate the stresses of salinity and drought and grow well in sandy soils. A major need is to produce higher numbers of female plants from a selected female with high quality fruit, and high salinity and drought resistance. These needs make date palms an ideal candidate for newer tissue culturing techniques to achieve reduced time for tree selection and savings in land and water, by producing female plants.

Activities include:

- in vitro screening for increased environmental stress tolerance and high quality fruit production
- somatic (single cell) hybridization and embryo culture techniques
- genotype/environment interaction for optimum productivity
- field applications of date palm plantlets.

2. Fermentation Technology and Microbiology:

a) Non-Conventional animal feeds:

The role of biotechnology in animal production is largely one of supplying tools to assist animal producers with breeding, health and nutrition. Egyptian efforts are more directed toward animal nutrition are very little progress has been made in reproduction, genetics or breeding. In nutrition some progress has been made in the use of local biomass and feedstuff residues in producing non-conventional feeds for the Egyptian market with positive responses from end-users. The need and market for high nutritional animal feed are high. There are an estimated 5.5 million head of cows and buffaloes (in a ratio of about 1:1) and a similar number and ratio of sheep and goats. The meat (425,000 tons) and milk (8 million tons) produced per year is below the demand of the Egyptian market and approximately 150 million L.E. are spent on imports of meat and milk products.

There is an estimated gap of some 9 million tons in the animal feed balance, about 4 million tons in concentrates and the rest in roughage. The large amounts of agricultural and agro-industrial wastes can be used to help solve the animal feed problem, provided the nutritive value of the supplementary food can be raised sufficiently. Newer methods of fermentation processing offer the potential for upgrading feeds while minimizing the need to add other nutrients.

Activities include:

- Determining amounts and chemical constituents of local biomass and feed stuff residues, such as cereal stalks, grain milling by-products and ensilage (such as stillage and fermentation residues)

Screening, selection and improving microorganisms with significant capabilities for biomass degradation from two aspects;

- a. Converting degradable matter to highly nutritional by-products
 - b. Using degradable matter as a substrate to support the growth of microorganisms which themselves can be used as feeds because of their high nutrient content.
- Developing the fermentation process for agro-industrial wastes to produce high value by-products
 - Analyzing the produced animal feeds to provide combinations for a balanced diet, taking into consideration effects on animal and human health.
 - Developing feeding strategies for various regions.
 - Determining the socioeconomics and cost/benefit of establishing small, village-scale, non-conventional animal feed industries.

b) Fermentation Processing of Pulp and Paper Waste Liquor:

Large amounts of industrial wastes accumulate daily, constituting health and pollution hazards, and representing an economic loss in terms of the potentially valuable by-products which could be recovered. A specific example is found in the pulp and paper industry. One company near Alexandria discharges 45,000 cubic meters of "black liquor" waste per day from pulp and paper processing. On the one hand, the waste seriously pollutes the marine environment, on the other hand it contains approximately 20,000 tons of liquor and carbohydrate material. Appropriate fermentation processing can purify the effluent and yield valuable by-products such as purified liquor, sugars and alcohols.

Activities include:

- chemical analyses of black liquor effluent
- screening, selection and improvement of micro-organisms for degradation processing
- analysis of effluent for potential environmental effects
- analysis of chemical by-products
- analysis of socioeconomic and environmental benefits.

B. Computer Based Technology:

As Egypt has become more industrialized and output has risen, numerous problems have arisen which limit productivity, including poor electric power

management, inadequate control of input material quality, inadequate process control and large rejection rates for finished products. These problems severely limit output.

To counter these problems, three areas of computer based technology will be developed and applied: computer process control, computerized production management, and computer assisted design (CAD) and computer assisted engineering (CAE). Initial focus will be on the first two areas while capabilities are developed for later applications of CAD/CAE.

1. Computer Process Control:

a. Improved Electric Power Grid Management:

Electricity mismanagement causes severe industrial production problems, including dynamic and transient stability problems because of irregular load variations, frequency and voltage fluctuation, and premature load shedding to protect the network. Power grid management provides an excellent starting point for developing and improving capabilities in the process control area including some mathematical modelling and substantial amounts of real-time programming for grid control. Developing these capabilities could accelerate progress towards work in more complex process control efforts, such as the iron and steel industry.

Initial activities include:

- developing a computer-based mathematical simulation model at the electric power system for analysis of decentralized control strategies.

developing plans and models for real time computer grid management controls.

b. Improved Process Controls for Food Processing and Packaging:

Food processing and packaging is an important industry in Egypt in terms of production volume, rate of growth and prospects for export. The industry relies heavily on sequential processing. However, limited automated control process capabilities, results in equipment failures, spare part shortages, bottlenecks and down-time that sharply reduces production. Modular sequential controllers would improve maintenance and reliability, reduce spare part inventories, provide alternative material flows to reduce bottlenecks and reduce down time.

As in the electric power grid, work in this area is also a good introductory point for more complex work in process control.

Initial activities include:

- applying this hardware and software to specific industrial problems that can be assisted by intelligent sequential controllers,

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developing generic modular control systems (hardware and software) based on built-in microprocessors.

2. Computerized Production Management:

In crucial industries, such as iron, steel, cement and textiles, problems of raw material quality control, production processes control and high rejection rates for finished products severely limit productivity. For example, the nominal annual production capacity of Helwan Iron and Steel company is 1.5 million tons. Because of inadequate operating conditions, actual production is below 1 million tons. Problems in the hot rolling mill result in a reject rate as high as 30%. Poor operating conditions at the blast furnace have also caused major problems in steel quality from the steel converter shop. These situations are caused by a variety of factors, including lack of real-time information on raw material quality and process variables, inadequate process sensors, a lack of adequate controllers in processing, and obsolete (usually manual) control schemes.

A similar situation exists in the textile industry. In the latter, the quality of the annual cotton crop, variation in weaving processes, growing use of synthetics, and large variations in machinery pose substantial operating problems. To counter these problems there is a pressing need for decision support systems which can rationalize the different elements of productivity. Textile processing, as compared to the complexities of process control in other industries offers a preferred starting point for this type of activity.

Initial activities include:

- development of computer-based management information systems and integrated data bases to provide decision support on different elements affecting productivity, e.g., production scheduling, inventory, transportation and skilled manpower.
- development of process simulation models for integration with the decision support system for key elements in process control.

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Problem Area - Research Project Selection
and Management Process

<u>Element</u>	<u>Responsibility</u>	<u>Criteria/Condition</u>
1. Problem area selection	End-user/Technical Liaison Unit	a) Problem explicitly expressed, liaison agent stated goal, result and dissemination method. b) End-user participation and funding support.
2. Problem area definition	Project secretariat/ Technical liaison agent	a) Relevance to GOE priorities. b) Application related to goal and objectives. c) End-user commitment. d) Existence of R&D capabilities. e) Interdisciplinary and interinstitutional cooperation. f) Consistency with AID policy.
3. RD&E project definition	Project Secretariat	a) Technoeconomic feasibility of research proposals. b) Subproject likely to provide solution to problem areas.
4. Proposal solicitation through RFP	Project Secretariat	a) Project description. b) Purpose and scope well defined. c) Description of project management and administration. d) Emphasis on interdisciplinary and interinstitutional cooperation. e) Role of end-user, its participation and commitment to proposal. f) Well-defined mechanism of technology transfer. g) Contract format attached.

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<u>Element</u>	<u>Responsibility</u>	<u>Criteria/Condition</u>
5. Proposal advertisement	Project Secretariat	a) Egyptian universities/research centers invited to submit proposals. b) Consortium of Egyptian universities and centers encouraged. c) Private sector researchers.
6. Proposal evaluation	Project Secretariat/ Technical review groups	a) Selection based on well-defined criteria as in sections 2, 3, 4 above. b) Winning proposer should have R&D capabilities to perform research and initially implement results. c) End-users participation and technology transfer potential should be demonstrated. d) Proposal selection based on technical and financial costs.
7. Proposal contracting	Project Secretariat as contracting agency Contractor: winning proposer.	a) Scope of Services based on winning proposal b) End-user responsibilities and matching funds clearly defined. c) Payment schedule limited to clearly defined benchmarks.
8. Research monitoring	Project secretariat	a) Contract monitoring. b) Achievements reported. c) Problems/Solutions proposed.
9. Research evaluation	Project Secretariat/ USAID project officer	a) Review of project progress. b) Measurement of what was planned to what was achieved. c) Recommend continuation or discontinuation of project.

Technical Analysis

1. Introduction:

The SIC component is designed to help solve priority development problems. RD&E subprojects will be funded to provide technologies or technical inputs which facilitate sound problem solution.

Problems having socioeconomic effect on and importance to end-users can best be identified and investigated through direct involvement of end-users. The design team visited seven governorates talking to Governors, regional officials, industrialists, citizens and university and institute staff members. In addition, several design team members were also members of the USAID funded, eighteen month Egyptian Science and Technology Assessment. They concluded that priorities and problem perception in the governorates and industry differ from perceptions at the national level and in the S&T community. They also concluded that not all problems posed could benefit from technological interventions and that criteria are needed for selecting problem areas and specific subprojects to be included under SIC.

As a result of these widespread consultations, the component design has selected priority areas in each of three categories: national development problems (construction materials, industrial chemicals and minerals, and soil characterization); regional/local development problems (lake ecosystem improvement, water and wastewater, and small-scale industries); and advanced technology topics (biotechnology, and computer based technology). Discussion of these areas and preselected initial subprojects are contained in Section III.E and Annex D of this paper. The preselection was carried out to test the processes designed to continue identifying problems and providing the basis for early implementation of component activities. The methods, criteria and issues critical to the technical feasibility of SIC have been established.

2. Problem Area Selection:

The design team met with a diverse representation of Egyptian society and was exposed to a wide range of problems. The team believes the following criteria are the most important for selecting problem areas for SIC concentration.

- The problem identified by an end-user or someone in direct and continued contact with the end-user.
- The problem should be expressed in clear (non-technical) terms with an explicitly stated goal, result or end point.

- The potential for RD&E inputs is obvious.
- The extent of the target group together with an estimate of the economic and/or social effect, is available.
- There must be an expression of willingness on the part of the end-user to participate in further problem definition, testing and demonstration with inputs of time, facilities or other resources as appropriate.
- The problem must be consistent with Egypt's development needs and could independently be verified as a priority.

STC has explicit mechanisms to continue interaction with end-users in identifying new problem areas using the above criteria. First, the Steering Committee will have a diverse membership including regional officials, industrialists and members of the S&T community. The Steering Committee can provide, directly and through its contacts, priorities and new problems (see section VI.3 for discussion of the STC management and service functions).

Second, the Project Secretariat will have a Technical Liaison Office with field representation in contact with end-users on a continuing basis. The role of the technical liaison agents is attached as an Appendix I. Problem areas will be screened by the Secretariat and its Technical Review Panels, and final recommendations will be made to the Steering Committee for approval with USAID concurrence. These mechanisms ensure that new problem areas are of priority, reflect end-user effect, have potential solutions and are consistent with AID policies.

3. Problem and Subproject Definition:

Priority problem areas are, by definition, broad topics containing a multiplicity of problems. Problems, as characterized by end-users, often are not in a form that immediately translates to a program of RD&E activities. It is the responsibility of the Secretariat to undertake the detailed definition of problems in a manner consistent with the eliciting effective proposals. The Secretariat, the Technical Review Panels and Special Study funds are resources available to carry out detailed problem and subproject definition. This includes economic and social constraints which RD&E proposals must address. The Secretariat will also be responsible for assessing problem priorities and socioeconomic effect to establish appropriate subproject funding ceilings, thus assuring proper allocation of STC grants.

4. Proposal Solicitation and Subproject Award:

Procuring RD&E services will be competitive with RFPs based on problem definitions. End-user involvement with the RD&E team is deemed essential. Explicitly designating end-users and the means for interacting with the subproject is particularly emphasized as an evaluation criterion and a

~~prerequisite to subproject award. Interdisciplinary and multi-institutional~~ proposals or local consulting subcontracts are encouraged. This will help ensure that the RD&E programs address all aspects of a problem and that well qualified personnel are involved. The Secretariat may group closely related problems into a single RFP to use better the available resources. The Technical Review Panels will review screened proposals forwarded by the Secretariat and make recommendations for grant awards or for rebid as appropriate.

5. Subproject Review and Evaluation:

A computerized management information and project tracking system will be installed in the Secretariat for recording and monitoring all subproject activities including expenditures and quarterly technical progress reports. These reports will be reviewed by the Technical Review Panels who will report any significant findings, conclusions or major deviations from the subproject plan Secretariat project progress more generally, and, if required, requested to approve fundamental changes in or termination of subprojects. The review and evaluation procedures are designed to promote subproject performance at satisfactory levels.

6. Advanced Technology:

This element of STC is directed to capacity building in areas of rapidly advancing technology. In addition to problem resolution, these subprojects will be used as the vehicle for increasing the size and skills of an existing but small nucleus of personnel and facilities. Competitive proposal solicitation will be used. Proposal review and evaluation criteria must place special emphasis on the appropriateness of training plans, the utility and versatility of proposed equipment purchases and the effective use of foreign consultants. These additional criteria will help ensure the optimal, cooperative use of limited (in view of the breadth and pace of these technologies) STC resources.

7. Egyptian S&T Capacity:

Prior USAID and GOE S&T projects have increased the problem solving capabilities within the Egyptian S&T community. STC will support the creation of a data bank of local skills and facilities to assist proposers in the forming RD&E teams and selecting local consultants. Compensation scales will be competitive with private industry and consulting firms to attract the best available talent. An adequate supply of trained personnel exists to undertake RD&E in the national and local problem areas that are likely to be selected during the LOP. Short-term, specialized training, necessary to effectively address a topic, and U.S. technical assistance can be a part of a proposed RD&E project plans. Advanced technology is a special case requiring more extensive training, equipment. Statistics on the number of Ph.D., M.S. and B.S. degrees do not properly reflect the capacity of the S&T community for purposes of this project component. Research experience, problem solving skills and regional location are among the special concerns of STC. These

characteristics have been embodied to some degree in past COE/AID projects which are currently phasing out or which have diminished activities with a limited time until EOP. The total funding for these projects exceeds that of SIC, and, by inference, some of the researchers released could work in this component. Further, increasing numbers of Egyptian scientists and engineers are returning from employment in other Mid-East countries, some with potential skills for SIC. Capabilities of the regional universities and research institutes have not been widely employed in past S&T projects but will be used by SIC. Thus, it is believed that sufficient capacity exists in the Egyptian S&T community to fulfill the component needs.

8. Issues:

There is a limited experience in Egypt of interdisciplinary, multi-institutional S&T projects directed to practical solutions for development problems. Egypt's training and institutional setting emphasizes specialization and rewards academic values. The integration of social and economic studies with physical science and engineering activities has often been a deficiency in earlier problem solving projects. SIC seeks to alter the patterns of S&T endeavors and institutionalizing these changes in a measurable degree. An issue is whether the features incorporated in the component design are adequate to accomplish the desired (and necessary) changes.

9. Conclusions:

The component activities will begin with preselected problem areas which reflect priority development needs of the country and for which RD&E can be expected to contribute to effective solutions. A series of procedures, policies and controls are included in the project design which will lead to continued selection of priority problems and the implementation of carefully selected S&T interventions. Review, evaluation and oversight mechanisms are included to permit timely corrective action should results and experience so indicate. SIC, having considered alternative approaches, is technically achievable and sound.

Technology Liaison Agents

One of the weaknesses of Egypt's R&D community is the lack of effective and appropriate technical liaison and extension activities. It can be demonstrated that Egyptian R&D is generally of high quality, however, interaction between researchers and potential end-users is infrequent.

Industry and most other end-users are not interested in laboratory research results, which are usually not in a form they can effectively and immediately use. Their needs are for simple problem solving, technical assistance, analysis and testing, quality control and techno-economic feasibility studies. End-users may be interested in application or modification of technology to enhance their product or process line, but this usually involves little basic research.

The GOE now emphasizes applying S&T to national development problems and encouraging interaction between R&D centres and university faculties and end-users. It is appropriate to create a cadre of "Technical Liaison Agents" serving to interact between R&D units and end-users. This approach has been successful in Central America (supported by ROCAP funding), Brazil, Korea, and Turkey, where the problems and needs of end-users are brought to the attention of R&D units, and the capabilities and expertise of R&D units are explained to end-users.

The Secretariat's Technical Liaison Agents will be industrial engineers or industrial economists preferably with prior industrial experience, and their salaries will be competitive with private industry. They will operate under the Secretariat's Manager of the Technical Liaison Office, and be responsible for:

- identifying end-user problems;
- providing or referring technical information to the R&D units or the STI;
- referring alternative assistance resource to end-users;
- describing R&D results in language appropriate to end-users;
- assisting in promoting the R&D units' capabilities and creating awareness in end-users about the R&D units' activities;
- following-up to ensure that problems have been solved, and that end-users are satisfied with the results.

The Technical Liaison Agents, in addition to daily contacts with end-users, will gather data in their specialty area for inclusion in the Project Management Information System, and should include the following:

- inventory of industries/end-users by sectors,
- inventory of industry/end-users products/needs,
- indication of new product/process/need/interest,
- availability of Governorate funds to support or joint-venture R&D and services,
- existing interactions between industry/end-users and local R&D units,
- information on R&D skills and facilities available, and those required;
- names of senior persons to contact.

During the initial stage of STC, an initial two Technical Liaison Agents will be recruited and trained. Suitable office space will be provided by the Governorate. Support services will include: office furniture, telephone, computer node connected with the STI, and secretarial assistance. Transportation will be required. Based on the experiences of these Agents, additional Agents will be placed in other Governorates.

Training of Technical Liaison Agents will to include the following:

- One month on-the-job training with the Industrial Liaison Unit of the Turkish National Research Council (TUBITAK) in Istanbul and in TUBITAK's regional centers.
- Two weeks on-the-job training in technological information accessing at STI.
- Two weeks in the major national R&D centers and universities to learn about capabilities and facilities.

In order to optimize effectiveness of the Technical Liaison Agents, quarterly three-day meetings will be held with the Project Secretariat for sharing experience, discussing problems, and planning future activities.

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Cost Effectiveness Analysis

I. Introduction and Scope:

Traditional approaches to the economic analysis of projects such as costs, benefits, rates of return and absorptive capacity cannot contribute much to formulating or appraising of the Science and Technology Cooperation component. The reasons are several: the outcomes of RD&E cannot be predicted or quantified at the outset; the costs of implementing an as yet unidentified technology are speculative; detailed problem definition is a part of the project; and data on the current status of the S&T community and its activities are fragmentary. AID, the World Bank and other donor organizations have limited experience in comprehensive projects designed to substantially effect a country's S&T infrastructure and processes. Consequently, efforts to assess a national S&T situation and the economic effect of promoting substantial S&T development, receives little guidance from analytic models used in assessing in standard projects.

It is possible, however, to examine the management and administrative measures planned to ensure that the most cost effective S&T approach is taken. Also, the relative effectiveness of alternative approaches can be considered. Qualitative estimates of absorptive capacity of the Egyptian S&T community and trends in local S&T expenditures can also be used to consider project effectiveness.

II. Cost Effective Management:

The STC management plan is described in Section VI.B and Annex J. The elements important to cost effectiveness are briefly restated here.

A. The Steering Committee:

The Steering Committee will have a broadly based membership including end-users, regional authorities, economists, social scientists, physical scientists and engineers. One of the Steering Committee's responsibilities will be to advise on the priority of problem areas recommended by the Project Secretariat. The Steering Committee will also assess annual progress toward the goals and purpose of the component and so report to AID.

B. The Project Secretariat:

The Secretariat will fund subproject definition studies as a precursor to soliciting and awarding subproject contracts/grants. These definition studies will include three considerations of particular importance to cost effectiveness:

- o Who are the specific end-users and their commitment to evaluation and testing?
- o What is the likelihood that practical technical outputs will result from a research activity that the results will be applied?
- o What are the social and economic constraints to implementing a positive subproject result?

The following is a hypothetical example of the kind of analysis that will be a part of pre-project definition. The approach will be modified as RD&E progresses, if needed.

One small-scale industry which may be assisted is furniture manufacturing in the Damietta Governorate. This industry employs 55,000 workers and has a gross output of approximately LE 300 million per year. Design, marketing assistance, training, and tooling are needed to increase furniture export sales. A project input of \$190,000 over 2 years will be required.

INTERNAL RATE OF RETURN - FURNITURE MFG.

Item	Cash Flows (\$000)					
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Training	0	-20				
Salaries	-50	-50				
Miscellany	-10	-10				
Tooling	0	-50				
Furn. Export*	0	0	33	67	100	133
Net Cash Flow	-60	-130	33	67	100	133

IRR 18.9%

The criteria by which subproject proposals will be screened and evaluated include:

1. Clear statement of the problem to be addressed, purpose, objective and significance of the applied research.

* Assuming an annual production increase of 0.15% for new exports, 10 percent net profit (LE 300 million base). Shadow price of foreign exchange is not included.

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2. Economic feasibility, social viability and environmental effect of the proposed work.
3. Clear statement on the role of the end-user and type of participation (in project design, implementation, finance, space and facilities). Ways in which beneficiaries will profit. Evidence of links with end-users will also be necessary.
4. Detailed research plan including plan of operation and methodology.
5. Detailed implementation plan, with verifiable bench marks against which progress can be measured, including procurement schedules, if applicable.
6. Full line item budget, including foreign exchange requirements, travel, salaries, (consumable materials and supplies, consultancies, and well defined subcontracts, and statement of semi-annual funding requirements.
7. Description of equipment needed by the project, and facilities and equipment available to the project.

Performance against these criteria will be evaluated or measured as a part of sub-project review and appraisal. If strict adherence to the criteria is instituted and maintained, it is believed that a cost effective approach to S&T activities will result

III. Alternative Approaches:

This component will use Egyptian S&T skills to the maximum degree possible. It would be possible to employ U.S. consultants for the two elements which seek to contribute to the solution of priority development problems having socioeconomic importance. The costs for an 8 week consultancy can be estimated as:

Consultancy Fees	42 X \$ 200 =	\$ 8,400
Per Diem	56 X 66 =	3,696
Int'l Travel	2,500 =	2,500
Local Lab Fees	10 X 100 =	1,000
Local Expenses	40 X 6 =	240
<u>TOTAL</u>		<u>= \$15,836</u>

Costs per Work Day (40) = \$ 396

The difficulties of gaining access to and working in local laboratories as well as communication gaps are not adequately accounted for in the above.

A local team of 3 persons consisting of a principal investigator, an associate professor and a graduate assistant, each being paid at FSN scales, would cost

approximately \$ 348 per 8 team hours worked. The comparative advantage of a consultant having current technical knowledge and greater problem solving experience is offset, in part, by the team's understanding of local issues and laboratory access. The greater personnel resources that can be applied using Egyptian skills are likely to be more cost effective especially when credit is given for the experience retained and easy followup with end-users.

Yet another alternative would be management of the component by ASRT with technical inputs from its Specialized Councils to the Project Secretariat. Costs would remain essentially the same. However, past experience strongly indicates that effectiveness would be markedly reduced. Problem definition, social and economic inputs are not well delineated in current ASRT practice nor is there any real emphasis on the role of specific end-users as stressed in this project. It is concluded that this would not be as cost effective as the management mechanisms proposed which include rigorous application of criteria for proposal review and award and for subproject appraisal.

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Social Soundness Analysis

Socio-Cultural Feasibility:

Substantial Egyptian investments have been made to create a strong scientific and technological infrastructure. Egypt has a high regard for science and has a very sizeable and well trained scientific community which consists of more than 40,000 Ph.D. and M.Sc. holders distributed among the 250 Egyptian research institutes and universities. The policy environment, however, has led to the S&T community being isolated from the productive sectors and much of the decision making on technology for the solution of development problems. Despite a recent marked improvement in the capabilities of the Egyptian S&T community to conduct applied and development research, most research has been diffused, underfunded, uncoordinated and driven primarily by scientific disciplinary interests. This has resulted in less than optimal application of the technologies that were transferred.

The Egyptian Government, under President Mubarak, has made several specific pronouncements since 1982 on the use of science and technology for development emphasizing the need for greater focus on specific problems to optimize resource use. These statements parallel measures designed to attract foreign private investment to Egypt. As part of these new policies, there has been a call for closer links between Egyptian scientific institutions, universities, and productive sectors. In that context, the President and the Prime Minister have requested the universities and research centers to be the technical consulting body of the Government. The Egyptian government frequently uses the task force approach consisting of ministers, researchers, university professors, industrialists and end-users to provide advice and action plans on issues related to energy conservation, water and wastewater and housing policies.

There is a clear emphasis on making the Egyptian S&T community more responsive to national development goals. There are, however, deeply rooted institutional and attitudinal factors which provide some resistance to using science and technology. Substantial recognition of the usefulness of S&T in solving development problems has emerged as a result of three AID projects: Applied S&T, University Linkages and Development Planning Studies. The Egyptian S&T community must concentrate its efforts on demand-side research to solve major development problems in infrastructure and increase productivity.

Twelve years after the adoption, of the "open door" policy, there is a continuous debate about Western influence and the process of modernization in which science and technology play a role. Such debate has led many to counteract the rapid process of modernization by adopting a more conservative and religious attitude in ordinary day-to-day life. The application of

science and technology to problems having visible socioeconomic impact may help to moderate this debate.

The Spread Effect: The Diffusion of Innovation:

Spreading the results of this component will depend primarily on the effort of government agencies, local authorities and the Federation of Egyptian Industries which are represented on the Steering Committee. They were purposely selected to help in diffusing all positive results generated by STC for solving national/local problem areas. The STC is a demand driven project in which the end-users (organizations, private and public firms) have a vested interest (financial and human resources) in defining the problem areas, monitoring, and implementing the research results.

The specific spread potentiality of this component will vary substantially among the different problem areas. The RD&E activities that are related to the national problem areas of construction materials, soil characteristics and industrial chemicals will have a wide effect in different parts of the country. The efficiency and speed of diffusing RD&E results to be applied by individual farmers/or industrialists will depend on extension services, transmission through national enterprises, and the availability of credit and investment for replicating the technology. The STC component provides funds in each problem area for the analysis of social and economic factors important to accepting, adopting, and spreading technological inputs to productivity and quality of life improvements.

Some RD&E will address technology to be adopted by relatively concentrated producing units, for example computer based technology for the food processing and packaging industry. The spread effect should take place rapidly given the limited number of packaging and food processing firms and existing communications channels through the General Authority for Food Industry and the Federation of the Egyptian Industries.

The information services are designed to increase the frequency and effectiveness of interchange among researchers, faculties and end-users. This will be accomplished by: 1) technical liaison officers responsible for informing end-users on progress of solving problems and diffusing results to local and regional authorities; 2) the ENSTINET, which universities, will permit local/regional universities to be linked directly to the five sector nodes at the Ministries of Health, Industry, Energy, S&T and Agriculture.

Social Consequence and Benefit Incidence:

The ultimate beneficiaries of the components are the end-users directly involved in diffusing the problem, evaluating and testing the technical inputs to problem solution, and in planning and implementing these solutions. One criteria for selecting the problem areas is that solution to these problems will affect a large segment of the Egyptian population.

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The social consequences will vary with the different problem areas whether they are of national/or local dimension. The social consequence of funding a new substitute for the Nile silt brick will increase employment and investment. The GOE ban on manufacturing Nile silt bricks resulted in a loss of employment of approximately 72,000 families and a short fall of 4.5 billion bricks a year. Similarly, developing new chemical or industrial products will translate into a saving of foreign imports and incremental job creation.

At the local and regional level, a wastewater treatment plant at the municipality, village, and rural household level, will directly benefit the health of the poor, and increase the effectiveness of past and future capital investments in wastewater treatment. Similarly, introducing new technologies in furniture manufacturing and dairy products will increase job opportunities, decrease rural/urban migration, and will open new export markets.

Developments in biotechnology will increase productivity in basic conventional crops (foul, berseem, dates) in semi arid lands, and positively affect the poor as producers and consumers. Developing new or improved fruits and vegetables will increase the income of individual farmers and improve the health of the rural population.

The secondary beneficiaries are those research scientists and the institutions participating in solving problem areas defined by the end-users. The component encourages and facilitates linkages between Egyptian scientists and institutes in further developing Egyptian problem solving capacities.

In sum, S&T is by nature an endeavor that must be conducted by highly trained people. Its societal effects can be virtually universal, depending on the technology involved, the efficiency of diffusion, the economic and social framework and the equity with which that framework allows assets and income to be generated and shared.

There are planned project activities that would have a direct benefit on the majority who live in rural areas, and particularly on the rural poor. These benefits include farm and non farm employment, agricultural improvements, health, improved standard of living, and the environment.

The Role of Women:

The scientific establishment provides few obstacles to women in attaining professional and executive status. Women will have equal access to RD&E project activities because funding awards will be based upon proposal soundness and applicability to Egyptian development priorities. No particular component design element is included to enhance or minimize the role of women.

The RD&E projects have potential for involving women at all levels as ultimate beneficiaries. Health care, food production and employment generating applications of technology are expected to produce benefits accruing to Egyptian society as a whole and, in some cases, to women in particular.

I. EXAMINATION OF NATURE, SCOPE AND MAGNITUDE OF ENVIRONMENTAL IMPACTS

A. PROJECT DESCRIPTION

The Science and Technology Cooperation Component is designed to help solving priority development problems socioeconomic effect on end-users, and to improve S&T capacity in specific problem related technologies. This will be accomplished by focusing applied research on developing and adapting technologies to help solve specific national, local/regional and advanced technology priority problems. The ten major research areas are:

construction materials; industrial minerals and chemicals; soil characteristics; lake ecosystems; water/wastewater treatment; small scale industry; biotechnology in fermentation and semi-arid crops; and computer based technology in the food packaging industry; process control for the electric power grid and the metal industry.

B. Identification of Impacts

No adverse environmental effects are foreseen as a result of implementing this project. One area which may require positive controls in later project years, depending on subprojects chosen, is biotechnology and recombinant DNA in agricultural crops. Careful analysis will be made of each proposed activity and work will be strictly subject to the applicable Egyptian, NIH, EPA, or USDA regulations governing this type of research before subproject approval is given. Any potential environmental impact of follow-on implementation (not known at this time) will be identified and resolved during the research and development stage.

II. CONCLUSIONS AND RECOMMENDATIONS

Based on the project description and identification of impact given above, it is judged that the project meets the criteria for a Categorical Exclusion under 22 CFR 216.2 (c) (2) (ii) and (iii), quoted below:

"(ii) Controlled experimentation exclusively for the purpose of research and field evaluation which are confined to small areas and carefully monitored.

(iii) Analyses, studies, academic or research workshops and meetings."

There will be no construction under the project. A categorical Exclusion is therefore requested.

memorandum

DATE: February 26, 1987

REPLY TO
ATTN OF: HRDC/S&T: Sherif K. Arif. *[Signature]*
Thru: HRDC/S&T: Lawrence J. Ervin. *[Signature]*
SUBJECT: S&T Cooperation Project Paper (263-0140.5) Environmental examination

TO: ANI:/PD: Stephen F. Lintner

Attached for your environmental review is the draft project paper entitled S&T Cooperation (263-0140.5). USAID/Cairo Project Review Committee has reviewed the draft which will be submitted to the USAID/Cairo Executive Committee in the next three weeks.

John Starnes, USAID/Cairo Environmental Officer, has reviewed the project paper content and recommended that a categorical exclusion be made. We have prepared the necessary statement for your approval: See Annex I.

I should appreciate your providing by cable your decision on the initial environmental examination so that we can include it in the project paper prior to submitting it to the Executive Committee.

Thank you very much for your cooperation.

Clearance: *[Signature]* John Starnes Environmental Officer

ACTION AID 3 INFO DCM ECON /5

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RR RUEHEG
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LOC: 018 100
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CHRG: AID
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ACTION TO		HRDC	PPA
ACTION TAKEN	DATE	INITIALS	
MAN	3/18	AA	

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E.O. 12356: N/A

TAGS: N/A

SUBJECT: EGYPT - SCIENCE AND TECHNOLOGY COOPERATION
PROJECT PAPER (263-2140.5) - ENVIRONMENTAL CLEARANCE

REF: ARIF/ERVIN - LINTNER MEMO 2/26/87

1. FOR USAID/CAIRO, LAWRENCE ERVIN, OFFICE OF SCIENCE AND TECHNOLOGY AND JOHN STARNES, MISSION ENVIRONMENTAL OFFICER FROM ANE/PD/ENV, STEPHEN F. LINTNER, ENVIRONMENTAL COORDINATOR.
2. ANE/PD/ENV HAS REVIEWED DRAFT PROJECT PAPER SUBMITTED BY MISSION AND CONCURS WITH RECOMMENDATION OF THE MISSION ENVIRONMENTAL OFFICER THAT THE PROPOSED PROJECT SHOULD BE GRANTED A CATEGORICAL EXCLUSION UNDER THE PROVISIONS OF 22 CFR 216, AID ENVIRONMENTAL PROCEDURES.
3. THE PROJECT PAPER SHOULD REQUIRE THE SCOPES OF WORK FOR PROPOSED RESEARCH PROJECTS INCLUDE, AS APPROPRIATE, AN EVALUATION OF POTENTIAL ENVIRONMENTAL IMPACTS WHICH MAY RESULT FROM THE APPLICATION OF SUCH TECHNOLOGY AND A REVIEW OF APPROPRIATE MITIGATION MEASURES TO ADDRESS POTENTIAL ADVERSE ENVIRONMENTAL IMPACTS.
4. GIVEN THE EXTREMELY STRONG CONGRESSIONAL INTEREST IN AID ACTIVITIES WHICH ADDRESS ENVIRONMENT AND NATURAL RESOURCE ISSUES, IT IS REQUESTED THAT THE MISSION PROVIDE INFORMATION TO ANE/PD/ENV CONCERNING THE PROGRESS OF PROJECT COMPONENTS (ECOLOGICAL STUDIES OF COASTAL LAKES, WATER AND WASTEWATER TREATMENT, ETC.) WHICH ADDRESS THIS CONCERN. SHULTZ

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Administrative Analysis

I. Statement of the Problem:

The critical contributions of the Science and Technology Cooperation Component will be: a) solving priority development problems having socioeconomic impact for end-users; b) improving S&T capacity in specific, problem related technologies; and c) increasing interaction between researchers and end-users to improve problem resolution.

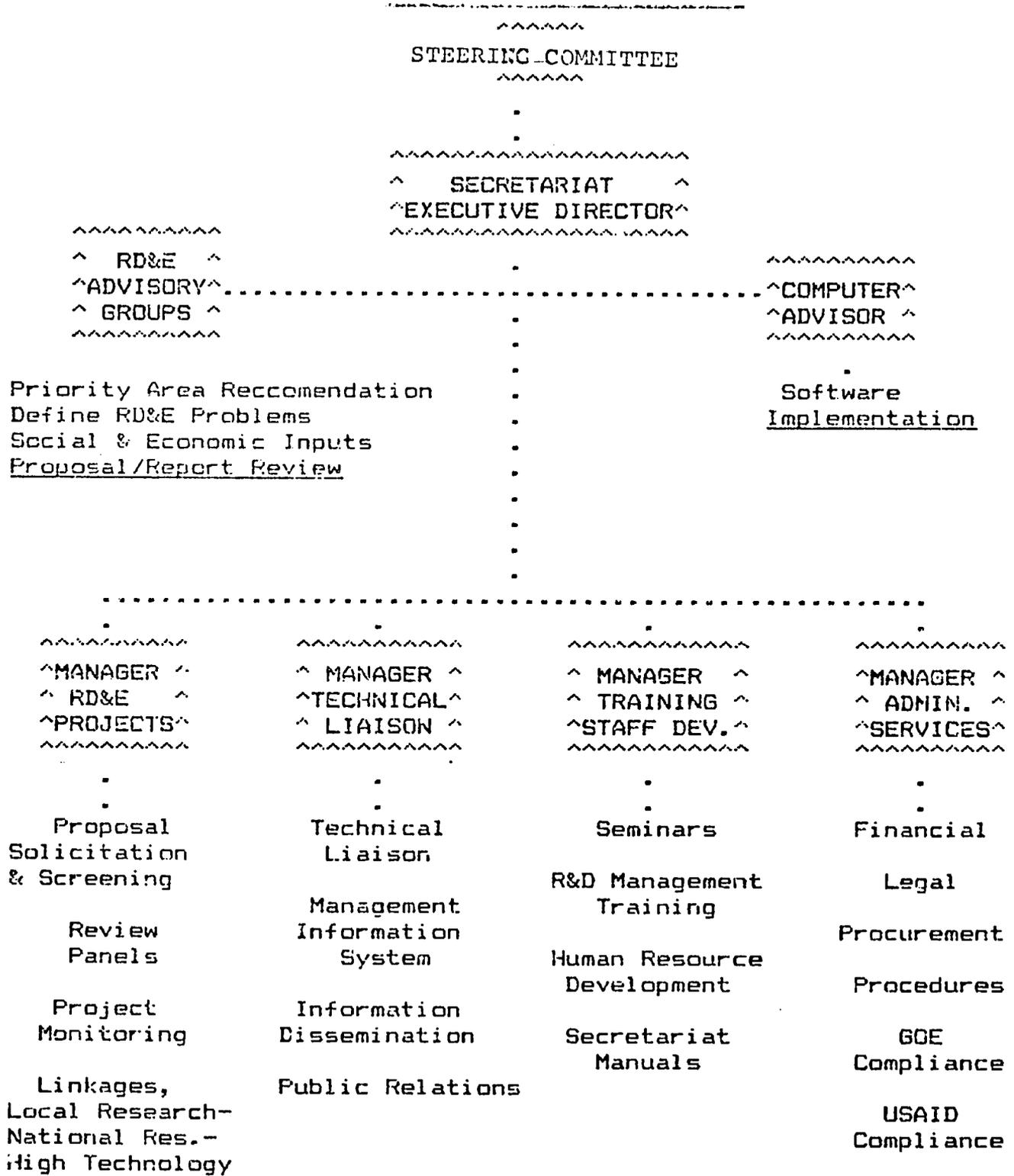
The STC Project management system requires a single funding, monitoring, and coordination unit (Project Secretariat) to ensure effective interaction between researchers and end-users. This management approach will result in better allocation of existing R&D capabilities, and creating new or strengthened R&D capabilities. These capabilities will be focused on clearly defined local, regional and national development problems. Figure 1 presents the proposed management structure.

The STC Component, through the Steering Committee and the Project Secretariat, with advice of a Technical Liaison Unit, will: 1) finance R&D and related socioeconomic analysis crucial to end-users and consistent with development priorities; 2) use R&D to upgrade and strengthen the capacity of local and regional universities to solve local or regional problems; 3) create linkages between local researchers, larger universities and/or national research centers which have problem area-related expertise and facilities; 4) encourage and strengthen a multi-disciplinary approach to solving national priority problems; 5) involve users of R&D, at the local, regional and national level, in identifying subprojects, pre-project planning, subproject proposal definition and execution, and in implementing R&D results; and 6) use technology liaison agents to foster linkages between users and producers of R&D, to identify additional problem areas, and to make relevant technical, social, and economic inputs into an STC Project Management Information System (MIS).

The Project Secretariat will commission special studies, using Egyptian and foreign consultants, and other institutions or bodies involved in technoeconomic, socioeconomic, and marketing activities, to: 1) identify and define additional problem areas; 2) establish the feasibility of funding subproject grants to solve problems; 3) provide guidance and assistance to all elements involved in the STC Component; and 4) continue the S&T policy dialogue with USAID.

FIGURE I

PROJECT SECRETARIAT
ORGANIZATION CHART



The functional activities of the Steering Committee include: establishing policy; approving problem areas; giving guidance to the Project Secretariat; and maintaining external coordination and linkages. Its responsibilities include: senior staff appointment; contract/grant approval above \$250,000; annual budget approval; semi-annual review of Project Secretariat performance and plans; and consultation with USAID.

The Project Secretariat will be the nucleus of the STC Project Management System. An Executive Director will be appointed by decree of the Minister of Scientific Research, and be an ex-officio member of the Steering Committee.

The functional activities of the Project Secretariat include: execution of policies and directives; recommending funding of subprojects; awarding grants below \$250,000 and monitoring contracts/grants; maintaining project records; providing project support services. Secretariat responsibilities include: recommending policies and procedures; soliciting and screening subproject proposals; providing data and analysis to the Steering Committee, providing quarterly reports.

The Project Secretariat will have the following organizational and operating characteristics:

- o an independent body linked with a GCE ministry enabling it to receive GCE financial support, yet receiving heavy managerial and technical inputs from the private/public sector as well as governorates in all aspects of its operations;
- o financed by the GCE with government budgetary support, but acting with a large degree of independence from standard GCE financial controls;
- o a legal entity with authority to contract for RD&E in the agreed upon problem areas, and to use AID and GCE funds for research in pilot plant or technical applications but also market the research applications to private and public sectors.
- o an entity with the capacity to deal with and enjoy the confidence of both private and public sector organizations, governorates and universities.
- o an organization run by professionals with both public and private sector orientation, experience in technology development, financing, and marketing; and
- o a body which provides an institutional and financial mechanism to enable S&T organizations to work together in resolving technology related constraints to Egypt's development.

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Finally, the Secretariat will should be a small, and responsive organization which serves as a focal point for managing diverse component activities and controlling GCE and USAID financial resources. The implementing agency should not be overburdened with operational responsibilities, pulling it away from its catalytic role.

Within the scope of the SIC, this organization should be able to discharge a set of specific functions as described in Section VI.E. of the Project Paper.

II. Issues Affecting Selection of Administrative Structure

The following questions were considered in evaluating the suitability of alternatives for an administrative structure of the implementation mechanism:

1. Should the organization be a public sector body (either as a part of a ministry or a state enterprise); or should it be a non-government entity, such as a private foundation or association?
2. Is it possible for an existing institution to take on the necessary functions or does a new institution have to be created? If a new institution needs to be created, is it possible to do so within the proposed implementation time frame of the SIC component?
3. Is the implementing institution to be a temporary organization whose functions will end with the completion of the SIC component, or is there a known or perceived need for a permanent organization, to continue to perform the intended functions after the SIC component is completed?

III. Alternatives Considered

A. GCE Government Entities

If the implementing agency were to be a GCE ministry there are four possibilities in housing the responsibility. With the strong focus on industry demand for technology or research applied to local/regional problems, the Ministry of Industry or Ministry of Local Government are potential choices. With the focus on applied research, the Ministry of Higher Education is a possible option. With the Project purpose of enhancing public and private sector application of S&T on a multi-disciplinary and multi institutional basis, the Ministry of Scientific Research is a possible choice.

1. Ministry of Industry

The logic of housing this Project in or affiliating it directly with the Ministry of Industry is more apparent than real. The link required is between the industries themselves, RD&E institutions and the RD&E process, not to bureaucratic intermediaries or ministries which regulate the activities of

industry. While the Ministry of Industry carries out functions which are designed to stimulate R&E in small and large industry, it is more a regulatory body than an investment body for funding R&E. In any event, this component is more interested in R&E application and innovation on the production line than in promotion and regulation. Therefore, the Ministry of Industry was not an appropriate body for managing the project.

2. Ministry of Local Government

The Ministry of Local Government does not have the internal organization for funding or marketing research. Under the AID funded Local Development Project No. 263-0182, a Technical Secretariat "Amana", has the responsibility of managing the different infrastructure activities in more than 24 governorates. The design team had several meetings with the Amana which concluded that a separate management system needed to be created. It should however, coordinate its activities with those of the Amana and be able to cooperate at the local and regional level.

3. Ministry of Higher Education

The Ministry of Higher Education could logically be considered a potential home for this component in view of the large R&E element related to universities inter alia and the management of the AID funded University Linkages project. The problem, however, is similar to the one with the Ministry of Industry, but in this case with a propensity for the supply side of technology rather than the demand side. The supply of technology should come from research, development and engineering operations whether they are conducted in industry itself, in research or technological institutions, in the universities, or if technology is transferred from abroad. The focus is on end-users of technology, i.e., the demand side. It is not on research per se and certainly not on university research as such.

4. Ministry of Scientific Research

Under the previous governments, the Ministry of Scientific Research was always linked to the Ministry of Higher Education and/or Ministry of Education. In November 1986, the Ministry of Scientific Research was disassociated from the Ministry of Education and Higher Education and given the objectives of formulating S&T policy and linking and coordinating the Ministry's activities with the other ministries. The Ministry is small; headed by the Minister of State, two undersecretaries of State and a small administrative staff. The ministry has neither the staff nor the existing infrastructure for managing this component. However, the Minister of Scientific Research was a prime mover of getting the S&T for Development project approved by the People's Assembly.

B. Non-Ministerial Gov't Entities

There is one organization affiliated with the Ministry of Scientific Research which at first glance would appear to have many of the attributes necessary for administering the program. This is the Academy of Scientific Research and Technology (ASRT).

In 1971, the ASRT was established by Presidential decree to be the responsible body for S&T policy and planning in Egypt. The ASRT has the following functions:

- o Supporting scientific research in solving problems of national priority.
- o Encouraging the application of modern technology in programs of socioeconomic development.
- o Formulating policies that ensure strong linkages between scientific and technological organizations in order to serve national development plans.
- o Participating in studying S&T aspects of major development projects.
- o Encouraging basic research, developing human resources, and making recommendations for new research institutes and centers of excellence.
- o Supporting scientific societies.
- o Developing international relations.

The ASRT organization is explained in Appendix 1 and its organization chart is shown in Figure 1.

ASRT's budget is derived solely from the GCE. ASRT has limited research resources and has sometimes been criticized for what is perceived to be a limited effect on development programs in Egypt. There has been a growing concern among senior officials to improve ASRT's impact and cost-effectiveness.

ASRT's next 5-year plan (1987-1992) calls for reforming in its operations and management of multi disciplinary and multi institutional research. ASRT is conducting a series of management options studies to evaluate its operations in relation to cost effectiveness and the country's needs, with an aim to streamlining its operations and improving its public image.

Some issues and problems identified by the design team include the following:

- o Although ASRT's legislation provides for necessary operational flexibility, ASRT itself has established a multitude of rules and regulations which limit that flexibility.
- o There is a shortage of capable staff at the senior and operational project management level.
- o There is a need for a modern R&D management system.
- o Adequate salaries for retaining trained and qualified professional personnel are inadequate.
- o ASRT is in the state of revising its operations and needs 12-18 months for a stable and effective organizational structure.

C. Non-Government Foundations or Associations

There are no existing non-government foundations, scientific or business associations that have the scope and stature to take on the responsibility for the proposed project management functions. Moreover, such an entity, were it

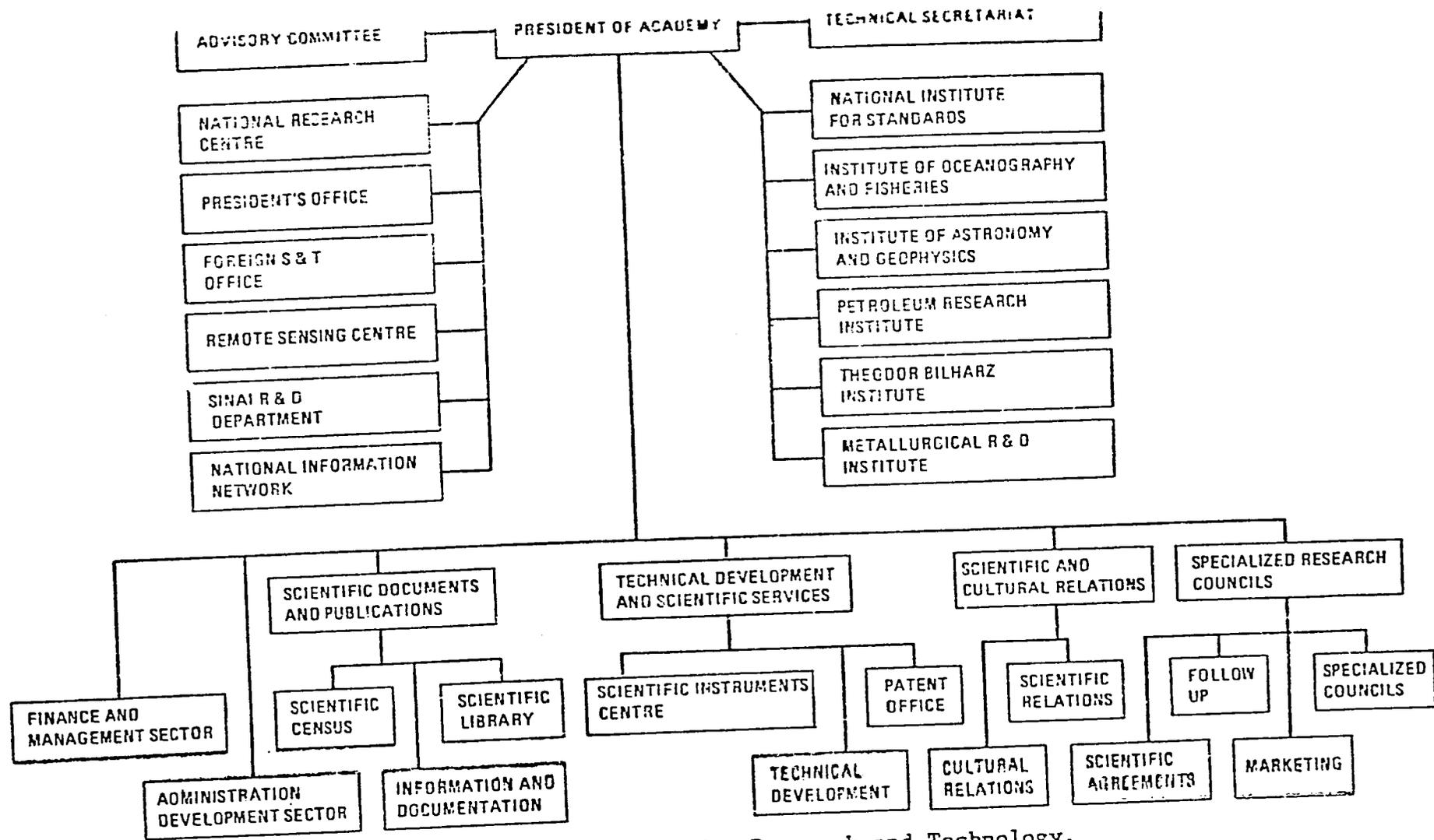


FIGURE 1 Organization chart: Academy of Scientific Research and Technology.

is to be created, would not be acceptable to the GOE as the recipient of the AID grant without proper legal and fiscal GCE control. Moreover, the GCE would find it extremely difficult to provide contributions to such an entity.

The alternative of breaking the component elements into individual pieces and administering each piece through a different organization (such as through institutes, universities, and private/public sector organizations,) was considered impractical and unacceptable to both the GCE and USAID. Success in developing the end-user directedness of applied research is supported by a strong interrelationship among the various program activities. Therefore, the GCE and USAID have concluded that a single control point is essential. However, as can be seen in the Component description, representatives from different existing institutions of the business and S&T community will be part of the new implementing organization, a Project Secretariat, to take operational responsibility for discrete segments of the component under the overall direction of a Steering Committee.

IV. Discussion

Based on organizational reviews and discussions, the design team concluded that no single, existing organization has the managerial and technical capacity or the organizational flexibility and authority to manage the diversified activities included in the STC component.

The implementing organization needs greater flexibility than can be provided if it were an Egyptian government agency. It also requires extensive private and public sector participation in its management. State enterprises have a significantly greater degree of operational flexibility than government ministries, and do allow private sector participation in their management.

A state enterprise now exists, the Academy of Scientific Research and Technology, that has the requisite legal framework. However, this institution (ASRT) also has other responsibilities (i.e. the operation of 8 research institutes) that would create a conflict of interest in its management of the tasks intended for the implementing agency. It is also in a period of transition to overcome certain managerial problems that might impede its effectiveness in assuming new responsibilities.

The alternative of creating a new organization, and thereby more government, is not attractive either. Nonetheless, a new institutional and financial mechanisms is required to forge effective public and private sector collaboration.

The Project design team has obtained agreement from all parties (GCE, ASRT and USAID) that the implementing mechanism will be a new independent unit of ASRT. This unit will be entitled to operate with all the authorized and flexibility bestowed on ASRT in performing the designated project functions. The unit will be free from pressure by ASRT officers and the ASRT Council in its decision making.

This is the some project management mechanism/approach, that has proven so successful in the Child Survival and Oral Rehydration Therapy (CRT) programs.

As a result, a Project Secretariat was designed with the desired characteristics and authority to perform the requisite project management functions.

The Secretariat will be created as a Unit of Special Character in accordance with GOE presidential decree No. 70/1986. A unit of special character provides greater management flexibility and the ability to generate and administer funds in accordance with a set of by-laws to be established by the unit. Presidential decree No. 70/1986 will provide the necessary flexibility for the Project Secretariat to carry out its functions in a timely manner. At the same time it will be linked with ASRT and the Ministry of Scientific Research, enabling it to receive GCE funds and AID grants. It would receive its direction from a Steering Committee representing a broad spectrum of public and private entities.

The Steering Committee will be chaired by the Minister of Scientific Research as chairman and by the President of the Academy of Scientific Research and Technology, as vice chairman. Membership will include two governors, one of them will be the chairman of the Interministerial Committee for Local Development "Amana", the Secretary General of the Supreme Council of Universities, the Chairman of the Federation of Egyptian Industries, one private sector representative, and one representative each from the Ministry of Agriculture and Ministry of Industry. The Executive Director of the USAID representative will be ex-officio members.

The Project Secretariat will be designed to manage all component functions with a small staff to support activity areas. This fixes responsibility for line functions clearly and practically. The Project Secretariat will have the ability to disburse funds and act promptly.

In an effort to attract highly qualified professionals, Project Secretariat salaries will be competitive with the private sector. Additionally, the Project Secretariat will be supported by technical review panel, long- and short-term technical services, and a Technical Liaison Unit.

In summary, the administrative structure selected for the implementation mechanism answers the three critical issues as follows:

1. The implementing organization (Project Secretariat) will be operating under the legal framework of a state enterprise (ASRT). It will have flexibility to allow selective exemption from CCE regulations that otherwise inhibit prompt performance of assigned functions. ASRT, as currently organized, is not operationally suited to act as the implementing agency.

2. An existing institution (ASRT) will provide the legal corpus for the Steering Committee and Project Secretariat. However, the Steering Committee and Secretariat will be parts of a newly created unit of ASRT. The only action required to create the Steering Committee and Project Secretariat is passage of a decree to do so by the Minister of Scientific Research and the President of the Academy. This is a Condition Precedent to disbursement. Funding can then be provided by AID and NPIC and recruitment of staff can begin.
3. It is clear that the functions assigned to the Steering Committee and Project Secretariat be continued, but the administrative and organizational structure may subsequently take a different form (e.g. a semi private foundation). The GOE is understandably reluctant to establish a permanent entity at this time, which may later be difficult to maintain or dismantle. Given the scarcity of models available to guide the design team in structuring this highly innovative, broad scoped, multisectoral activity, the team concluded that the professional management structure approach offers the greatest chance for success in initiating and carrying out this activity. It is anticipated that the evaluation, scheduled for 1991 will provide a basis for assessing the course and structure of this management unit.

Establishing the Steering Committee and Project Secretariat as proposed, should permit the successful administration of this project. .

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Academy of Scientific Research and Technology

The ASRT is headed by a president, appointed by a presidential decree, who has the rank of minister. The president serves as chairman of the ASRT council and is chief administrator of ASRT. The president's responsibilities include approval of the activities of the following institutes and centers belonging to ASRT. Each of these centers/institutes receive their funds from ASRT budget. The National Research Center, the Institute of Oceanography and Fisheries, National Institute of Standards, Institute of Oceanography and Geophysics, Petroleum Research Institute, Central Metallurgical Research and Development Institute, Scientific Instrumentation Center, National Information and Documentation Center, Remote Sensing Institute, Technology Development and Scientific Services Division, the Foreign S&T Office, the Egyptian National Scientific and Technical Information Network.

The ASRT Council:

As the policymaking body of the ASRT, the ASRT council sets policies that aim at mobilizing national S&T institutes in support of the priority problems of socio-economic development. Its resolutions are based on recommendations submitted by the specialized research councils. It approves budgets and expenditures. It gives state awards and considers issues assigned to the council by the ministerial cabinet or ASRT's president.

The council is headed by ASRT's president. Its members include the presidents or national universities, the directors of NRC, the atomic energy establishments, and the National Research Centre for Sociological and Criminological Research, and the ASRT vice presidents and undersecretaries responsible for S&T. The president of the ASRT appoints 10 members selected on the basis of personal merit.

The Specialized Councils:

Specialized councils are established to carry out ASRT functions in sectoral planning and coordinating of scientific research at the national level. In this endeavor, they can mobilize S&T manpower to serve national development priorities.

The ASRT has established 11 sectoral councils in the following fields of research: food and agriculture; industry; petroleum, energy and mineral resources; medicine and drugs; transportation and communication; environment; construction and housing; new settlements; economics and administration; society and population; and basic sciences.

Each council encompasses a good representation of leading research workers, technologists and users of research. The aim is to create interaction of interested parties at a high level of planning and coordination. Each council includes a number of specialized committees, which make recommendations to the parent council.

The Five-Year S&T Plan:

The ASRT's first Five-Year S&T Plan, for 1982-87, covers programs and projects that serve the national Five-Year Plan prepared by the government. A management system, also established by the ASRT, ensures the monitoring and evaluation of projects.

In 1981, as preparation for the plan, the ASRT council passed a resolution that assigns to the specialized councils the planning of programs to support the National Five-Year Plan (1982-87), prepared by the Ministry of Planning and approved by the Cabinet, the Peoples Assembly, and the President.

ASRT's technical secretariat summarized the eight documents of the national plan, emphasizing elements that required scientific and technical involvement. The summary was distributed to the 11 specialized councils, with a request that they come up with a plan of action, including priorities. Draft documents of a Five-Year S&T Plan were prepared and submitted to concerned ministries and sectors for comment and discussion. The final document was submitted to the President of the Republic, who supported the plan and approved the budget.

In December 1985, 152 ongoing projects had been approved by the ASRT, involving more than 1,500 scientists and technologists. About 75 percent came from the universities and ministries, in equal proportions, and the remaining 25 percent from the ASRT and its affiliated institutes.

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Financial Plan

1. Introduction:

SIC is a non-revenue producing component which will finance research, development and engineering activities directed to specified priority development problems. Financing will be through an Egyptian management unit, the Project Secretariat, which will be responsible for problem selection, competitive RD&E project awards and technical/financial tracking of implemented subprojects.

Six problem areas have been selected for initial implementation. For purposes of the SIC design, a number of RD&E subprojects have been conceptualized and these form the basis for the administrative and financial plans. This analysis explains and discusses of the cost models employed. The cost effectiveness of the SIC design is treated in Annex G.

2. National and Local/Regional Problems:

Subprojects in these elements may involve any scientific discipline and range in funding from small (\$25,000 - 50,000) to large (\$1 million and above). The conceptual projects reflect a modest spread of size.

Four topics were "budgeted" as typical subproject activities, two each in the national and local/regional categories; industrial chemical production from local minerals, an engineering oriented activity with capital intensive, full scale implementation, construction materials, a process development effort which could be either small or medium production size, water and waste water treatment conceptualized as two or three teams of trained personnel to conduct tests and analyses of faulty operating treatment plants and, lake ecosystems, a project to do careful sampling, analysis and system planning for better economic use of northern and eastern saline lakes. These projects differ in their scope, organization and range of financial inputs.

3. Advanced Technology:

This area seeks to build Egyptian capacity in two topics: biotechnology and computer based systems. Specific problems will be addressed during SIC implementation and again two projects were conceptualized; fermentation processing and computer process control. The advanced technology area differs from national and local problems in their training requirements and the equipment required to build Egyptian capacity.

4. The cost Estimate Model for RD&E Projects:

Specific cost estimates for RD&E were used when available. Dollars and local costs derived from dollars were escalated at a compounded annual rate of 5%. This is thought to be a compromise between the probably higher rates of inflation that are likely to prevail in Egypt and the currently low rates that are existing in the U.S.

Budgets were prepared for each of six projects with at least eight cost elements for each budget (see Appendix to this Annex). Percentages of total subproject cost were calculated for each cost element and, when more than one subproject was available, averages were taken. These budgets are presented in Appendix K.1. They were prepared for FY 87 with local costs in L.E. at the conversion rate of \$1.00 = L.E.2.17. Exchange rate for subsequent years was escalated on the difference between the L.E. and dollar inflation rate respectively.

The design team then estimated the number of problems that could reasonably be expected to be implemented during the LOP. The nature of the problem area and the relevance of S&T to the area, time and effort required to effect detailed problem definition and RFP's, capacity of the Secretariat to process solicitations, and the capacity in Egypt to undertake applied R&D were considered.

The number of projects in each area and their approximate timing were then derived. It was arbitrarily decided to assign subprojects as either large or small with the latter being one half of the former. With a "schedule" of subprojects, unit size and subproject element costs could be calculated from the percentages available. The model was selective in that individual percentages were applied to national problems, to local problems and to each of the two advanced technology categories.

While this model is limited in its statistical validity, the underlying "budgets" are felt to be representative of a typical RD&E subproject in these topic areas. The level of effort and suggested number of subprojects (approximately 50-60 over a six year period) is consistent with Egyptian S&T capacities.

5 Supporting Services:

The Supporting Services to STC consist of:

- a) The Egyptian Management Services
- b) Information Services provided by ENSTINET
- c) The Technical Support Services, which will be administered by USAID

The budget for these services is attached in Appendix.

a) The Egyptian Management Services (EMS):

EMS will be provided by the Project Secretariat and the Steering Committee. Project Secretariat will be formed by full-time Egyptian personnel who will be contracted by the Steering Committee. Project funds will be made available to contract on a full-time basis, the Executive Director, four managers, ten technical staff (including technical liaison officer) as well as four secretarial and administrative staff. The services will be retained during the LOP for a total of 133 manyear.

The salary of each project secretariat member was derived from the compensation plan used by USAID/Cairo for its foreign service national staff. The starting yearly salary of the Executive Director is L.E. 24,000 (\$11,000), the manager's salary is L.E. 18,000 (\$8,300) and the technical staff is L.E. 12,000 (\$5,500).

In addition to the Project Secretariat staff, the Project Secretariat will be able to draw upon the services of ASRT employees for accounting, contractual and administrative purposes. A compensation scheme was derived on the basis of L.E. 173,600 per year (\$80,000). These funds will cover incentives and honorari to the members of the Steering Committee and project secretariat for approximately 20-25 staff during the LOP at a monthly rate of L.E. 200 (\$92) per month. This incentive payment represents approximately 100% of the basic salary of an average GOE employee.

The Project Secretariat will also hire the services of U.S. consultants on a host country PSC in order to assist the Steering Committee in preparing the relevant policy studies for SIC. An estimate of approximately 6 man of level of effort is required, with a monthly rate of \$12,000. This includes salaries, international travel, per diem as well as miscellaneous expenses.

b) Information Services provided by ENSTINET:

The information services provided by ENSTINET will be managed by the central coordinating group at ASRT. This group is staffed with approximately 10 full-time, highly trained information and computer system engineers.

The component will bear 50% of the salary cost of the ENSTINET central coordinating group which will gradually decrease to 25% in FY 92 and 93. It is expected that ENSTINET will cover its remaining salary cost from the services it will provide to other clients in the S&T community. Salaries were derived from the FSN compensation plan.

U.S. consulting assistance is intended to keep ENSTINET abreast of latest technological and service trends and products and to facilitate accessing and procuring these products. The amount requested is equivalent to about 4 man and was estimated at \$50,000 for FY 88.

A major portion of the ENSTINET budget is in the information search and access to foreign data bases and documents. The STC component will subsidize the foreign data base searches which were estimated at an annual figure of 4000 and cost of \$35/search totalling \$140,000 a year. However, as a result of use of optical disc technology, it is assumed that the cost per search request will decrease, thus allowing the number of subsidized searches to be increased. Such expectation is realistic in view of the geographical extension of ENSTINET services to the local and national universities.

In addition, ENSTINET will be prepared to assist STC by building programatically oriented data bases of R&D projects, technical reports and scientific personnel. The budget for data base building has been estimated on the basis of 15,000 records per year at L.E. 15 per record - totally L.E. 150,000 (\$69,000). Additional funds were also budgeted for data services and collection by external Egyptian information groups.

An amount of \$200,000 was also budgeted for in order to procure computer software and hardware for the local universities which will be part of the ENSTINET nodes. A micro-computer (AT&T, 3 B2) with associated software and hardware cost approximately \$25,000.

c) Technical Support Services:

Project funds will be retained by USAID/Cairo to provide the following services:

- Management System Contractor to assist the Project Secretariat in different functions.
- Monitoring the STC component.
- Evaluation and audit.

Management System Contractor:

As explained in section VI.C.2 of the PP, a managerial system contractor will provide 18 months of services to the Project Secretariat. It is estimated that a total of 38 mm of effort will be provided by the 8(a) firm. Basic salaries were estimated at \$261/day with a field overhead of 60% of total salary, or G&A of 16% and a fee of 7%. In addition, funds were made available to the management system contractor to establish an office in Cairo for 18 months with appropriate administrative and secretarial staff.

- USAID Monitoring Services:

As indicated in section VI.C.2.b. of the PP, USAID will contract the services of an Egyptian project specialist and a secretary to assist the project officer in its monitoring activities.

The starting salaries of the project specialist and the secretary are L.E. 27,000 (\$20,000) and L.E. 7,200 (\$5,400) respectively. These salaries are consistent with the FSN compensation plan at USAID/Cairo. It is expected that FSN services will start in FY 88 and will last for seven years.

In addition, USAID will be contracting the services of U.S. short-term consultants to analyze new problem areas and conduct policy studies. A level of effort of 20 mm was estimated at \$12,000/mm.

IQC for Evaluation and Audit:

Two Indefinite Quality Contractors (IQC) will also be retained for evaluation and audit. The IQC budget for the Component's mid and final evaluation was estimated on the basis of a total 17 mm over a period of 2.5 months. The IQC multipliers for the contractor staff and for the consultants were estimated at 2.7 and 1.7 respectively.

The IQC budget for audit was estimated on the basis of 6 mm of effort using a multiplier rate of 3.0.

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ILLUSTRATIVE STC BUDGETS
1. NATIONAL RESEARCH PROGRAMS \$(000)

ANNEX K
APPENDIX 1

Item	FY 87		FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		FY 94		SUBTOTAL		TOTAL \$
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	
Research Grants/ Personnel			20	200	30	270	190	865	150	1,215	150	1,270	120	1,170	70	910	640	5,900	6,540
Participant Training					20		50		50		40		30		10		200		200
Commodities (Equipment/Supplies)			100	20	80	50	450	100	1,550	120	820	120		50			3,000	460	3,460
TOTAL	0	0	120	220	130	320	600	965	1,750	1,335	1,010	1,370	150	1,220	80	910	3,840	6,360	10,200
Cumulative Expenditures	0	0	120	220	250	540	850	1,505	2,600	2,840	3,610	4,230	3,760	5,450	3,840	6,360	3,840	6,360	10,200
Obligation	350	380	2,165	2,460			1,160	2,510			165	910					3,840	6,360	10,200
GOE			Salaries		Customs fees		Facilities & Supplies		Training										Total
LE			1,900		1,780		420		60										4,200

ILLUSTRATIVE STC BUDGET
2. REGIONAL/LOCAL RESEARCH PROGRAMS \$(000)

Item	FY 87		FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		FY 94		SUBTOTAL		TOTAL \$
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	
Research Grants/ Personnel			15	290	25	300	70	805	100	1,245	90	1,300	60	1,200	50	950	410	6,090	6,500
Participant Training					30		40		50		50		30				200		200
Commodities (Equipment/ Supplies)			50	20	130	20	295	30	300	40	360	30	280	30		25	1,355	195	1,550
TOTAL	0	0	65	310	185	320	405	835	450	1,285	440	1,330	370	1,230	50	975	1,965	6,285	8,250
Cumulative Expenditures			65	310	250	630	655	1,465	1,105	2,750	1,545	4,080	1,915	5,310	1,965	6,285	1,965	6,285	8,250
Obligation	170	470	950	2,300			810	2,600			35	915					1,965	6,285	8,250
GOE			Salaries		Customs fees		Facilities & Supplies		Training										Total
LE			2,600		750		729		22										4,100

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ILLUSTRATIVE STC BUDGETS
3. ADVANCED TECHNOLOGY
3.A: COMPUTER BASED TECHNOLOGY \$(000)

Item	FY 87		FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		FY 94		SUBTOTAL		TOTAL
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	\$
Research Grants/ Personnel			50	150	50	300	50	400	50	425	100	450	100	375	50	250	450	2,350	2,600
Participant Training			30		50		50		50		50		20				250	0	250
Commodities (Equipment/ Supplies)			390	10	190	20	525	20		25	240	30		35		25	1,355	165	1,500
SUBTOTALS	0	0	460	160	290	320	625	420	100	450	390	480	120	410	50	275	2,035	2,515	4,550

3.B: BIOTECHNOLOGY & GENETIC ENGINEERING \$(000)

Item	FY 87		FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		FY 94		SUBTOTAL		TOTAL
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	\$
Research Grants/ Personnel					50	275	50	350	50	375	50	400	200	450	150	500	550	2,350	2,900
Participant Training					100		100		60		40		60		40		400	0	400
Commodities (Equipment/ Supplies)					100	10	1,050	10	100	25	65	30	1,130	35	75	20	2,520	130	2,650
SUBTOTALS	0	0	0	0	250	285	1,200	360	210	400	155	430	1,390	485	265	520	3,470	2,480	5,950

TOTALS ADVANCED TECHNOLOGY

Total Expenditures			460	160	540	605	1,825	780	310	650	545	910	1,510	895	315	795	5,505	4,995	10,500
Cumulative Expenditures			460	160	1,000	765	2,825	1,545	3,135	2,375	3,690	3,305	5,190	4,200			5,505	4,995	10,500
Obligations	960	550	2,400	1,950			2,055	1,800			50	695					5,505	4,995	10,500
BDE			Salaries		Customs fees		Facilities & Supplies		Training		Total								
	LE		1,800		2,150		850		50		4,250								

ILLUSTRATIVE STC BUDGETS
4. EGYPTIAN MANAGEMENT SERVICES \$(000)

Item	FY 87		FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		FY 94		SUBTOTAL		TOTAL \$
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	
-Personnel		65		105	30	317	20	249	20	256		247		254		312	70	1,805	1,875
-Compensation		5		35		43		46		49		53		56		33		320	320
-Participant Training	10		10														20	0	20
-Commodities (Equip./Supplies)		70		60													0	150	150
-Steer. Coa. Tech. Serv.				4		4		3		3		3		4		4		25	25
-Meetings/Studies				10		10		15		20		20		20		15	0	110	110
TOTAL	10	140	10	234	30	374	20	313	20	329	0	323	0	334	0	364	90	2,410	2,500
Obligation	35	560	55	823				657				365					90	2,410	2,500
GOE				Salaries-Training			Customs fees-facilities												Total
LE				200			200												400

ILLUSTRATIVE STC BUDGETS
5. INFORMATION SERVICES (ENSTINET) \$(000)

Item	FY 87		FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		FY 94		SUBTOTAL		TOTAL \$
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	
Technical Services/ Personnel *			50	95	55	90	40	90	40	90	15	50	15	40			215	455	670
Inform. Search&Retriev.**			220	130	245	100	240	90	290	65	144	25	146	35			1,255	445	1,730
Commodities (Equipment/ Supplies)			80		85		10		10		7		8				200	0	200
Training ***			23		21		20		18		9		9				100	0	100
TOTAL EXPENDITURE	0	0	373	225	405	190	310	180	358	155	175	75	178	75			1,800	900	2,700
Cumulative Expenditures				598		1,194		1,664		2,197		2,447		2,700				2,700	2,700
Obligation	575	320	870	430			355	150									1,800	900	2,700
GOE				Salaries			Customs fees-facilities												Total
LE				350			330						information search						1,010

* Includes compensation, incentives, RD&E, consulting and local travel

** Includes equipment, maintenance, data base fees and supplies

*** Includes travel and per diem

BUDGET - NATIONAL RESEARCH PROGRAMS
(1980)

<u>AREA/PROJECT</u>	<u>FY87</u>	<u>FY88</u>	<u>Project Year</u>				<u>FY92</u>	<u>FY 93</u>	<u>Project Total</u>
			<u>FY89</u>	<u>FY90</u>	<u>FY91</u>				
<u>Construction</u>									
Materials		185	237	159	82			663	
Project			256	240	200	150		846	
Project				250	200	200	150	800	
Project					200	100	100	400	
Project					200	100	100	400	
<u>Industrial Chem.</u>									
Chem Process			300	263	199	192		954	
Project				200	100	100		400	
Project				250	200	200	150	800	
Project					200	100	100	400	
<u>Soils & New Areas</u>									
Soil Analysis			1129	370	394	207		2100	
Project			200	100	100			400	
Project				550	250	250	200	1250	
Project				250	200	200	150	800	
Project					200	100	100	400	
=====									
<u>Totals</u>	0	185	2197	2600	2524	1790	950	12254	
<u>New Project Starts</u>	0	1	4	5	4	0	0		
<u>Projects in Progress</u>	0	1	5	10	13	11	7		
<u>Total Number of Projects</u>								14	
					<u>Average Cost</u>			732	

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SURPROJECT - Construction Materials

<u>Item</u>	AID Funding										In Kind
	FY 88		FY 89		FY 90		FY 91		Total		
	\$ (000)	LE (000)									
Compensation	6	68	0	142	0	150	0	70	0	438	101
Consultants	12	0	0	0	6	0	0	0	18	0	
Equipment	80	0	100	0	0	0	0	0	180	0	
Supplies	0	28	0	40	0	50	0	30	0	140	140
Training	10	2	0	0	0	0	0	0	10	2	
Information	0	2	0	1	0	1	0	1	0	5	
Local Travel	0	1	0	2	0	2	0	1	0	6	
Foreign Travel	14	0	0	0	3	0	0	0	17	0	
Facilities											70
Other											
Totals*	116	93	100	185	9	202	0	110	225	591	316
\$ Equivalent	105		237		159		82		663		

* Totals may not agree due to rounding.

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SUBPROJECT - Soil Characterization

Item	-----AID Funding-----										
	FY 89		FY 90		FY 91		FY 92		Total		In Kind
	\$ (000)	LE (000)	\$ (000)	LE (000)	\$ (000)	LE (000)	\$ (000)	LE (000)	\$ (050)	LE (000)	LE (000)
Compensation	0	173	0	445	0	466	0	244	0	1329	306
Consultants	0	0	0	0	0	0	0	0	0	0	0
Equipment	840	0	0	0	0	0	0	0	840	0	0
Supplies	10	0	10	0	10	0	5	0	35	0	0
Training	0	0	0	0	0	0	0	0	0	0	0
Information	0	4	0	2	0	2	0	3	0	11	0
Local Travel	6	25	0	50	0	50	0	25	0	150	0
Foreign Travel	0	0	0	0	6	0	0	0	0	0	0
Facilities											85
Other (vehicles)	130	0	0	0	0	0	0	0	130	0	0
Total	980	202	10	497	10	518	5	272	1335	1489	391
\$ Equivalent	1129		378		394		207		2109		

* Totals may not agree due to rounding

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BUDGET - REGIONAL/LOCAL RESEARCH PROGRAMS
(\$000)

<u>MREA/PROJECT</u>	<u>Project Year</u>							<u>Project Total</u>
	<u>FY87</u>	<u>FY88</u>	<u>FY89</u>	<u>FY90</u>	<u>FY91</u>	<u>FY92</u>	<u>FY 93</u>	
<u>Lake Ecology</u>								
Lake 1	24	226	202	22				474
Lake 2		70	235	213	25			551
Lake 3			24	244	224	26		518
Lake 4				25	253	235	27	513
<u>Small Industry</u>								
Furniture		25	100	50				175
Milk Process.			200	100	100			400
Cheese Mfg.				200	100	100		400
Project				25	100	50		175
Project					25	100	50	175
Project					25	100	50	175
<u>Water/Waste Water</u>								
Team 1		41	147	92	25			305
Team 2			41	147	92	25		305
Team 3				41	147	92	25	305
<u>New Areas</u>								
Project		200	100	100				400
Project			200	100	100			400
Project				250	200	200	150	800
Project					200	150	100	450
=====								
<u>Totals</u>	<u>24</u>	<u>570</u>	<u>1250</u>	<u>1610</u>	<u>1616</u>	<u>1020</u>	<u>402</u>	<u>6472</u>
<u>New Project Starts</u>	<u>1</u>	<u>4</u>	<u>4</u>	<u>5</u>	<u>3</u>	<u>0</u>	<u>0</u>	
<u>Projects in Progress</u>	<u>1</u>	<u>5</u>	<u>9</u>	<u>14</u>	<u>14</u>	<u>10</u>	<u>6</u>	
<u>Total Number of Projects</u>								<u>17</u>
					<u>Average Cost</u>			<u>361</u>

SUBPROJECT - Water & Waste Water

Item	AID Funding										In kind
	FY 88		FY 89		FY 90		FY 91		Total		
	\$ (000)	LE (000)									
Compensation	0	42	0	115	0	121	0	32	0	310	71
Consultants	0	0	0	0	0	0	0	0	0	0	0
Equipment	0	0	44	0	0	0	0	0	44	0	0
Supplies	0	0	15	0	0	0	0	0	15	0	0
Training	0	2	0	0	0	0	0	0	0	0	2
Information	0	2	0	1	0	1	0	0	0	0	4
Local Travel	0	9	0	3	0	3	0	1	0	0	16
Foreign Travel	0	0	0	0	0	0	0	0	0	0	0
Facilities	0	0	0	0	0	6	0	0	0	0	0
Other											
Totals*	0	55	59	119	0	125	0	33	59	332	114
\$ Equivalent	41		147		92		25		385		

* Totals may not agree due to rounding.

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SUBPROJECT - Lake Ecosystems

Item	AID Funding										GDF In Kind LF (000)
	FY 87		FY 88		FY 89		FY 90		Total		
	\$ (000)	LE (000)									
Compensation	0	15	0	258	0	271	0	15	0	560	129
Consultants	6	0	0	0	0	0	6	0	12	0	
Equipment	0	0	19	0	0	0	0	0	19	0	5
Supplies	0	0	10	0	0	0	0	0	19	0	3
Training	0	0	0	0	0	0	0	0	0	0	
Information	0	5	0	2	0	2	0	2	0	12	
Local Travel	0	0	0	6	0	0	0	0	0	6	
Foreign Travel	3	0	0	0	0	0	3	0	6	0	
Facilities	0	0	0	0	0	0	0	0	0	0	79
Other											
Totals*	9	20	29	266	0	273	9	17	47	577	215
\$ Equivalent	24		226		202		22		474		

* Totals may not agree due to rounding.

SUBPROJECT BUDGET (000)

EXAMPLE 1: NODULATION & NITROGEN-FIXATION EFFICIENCY

	FY 88		!	FY 89		!(AID)	TOTAL FY		!GRAND TOTAL	!GDE in kind
	\$	LE		\$	LE		\$	LE		
Compensation		51.60	!		54.18	!		105.78	!	66.00
Equipment	20.00		!	10.00		!	30.00		!	
Training	10.50		!	10.50		!	21.00		!	
Tech. Assist.			!			!			!	
Travel	10.00		!	10.00		!	20.00		!	
Supplies	5.00	3.00	!	5.00	3.00	!	10.00	6.00	!	
Facilities		5.00	!		5.00	!		10.00	!	
Information		3.00	!		2.00	!		5.00	!	
Others		3.00	!		3.00	!		6.00	!	
TOTAL	45.50	65.60	!	35.50	67.18	!	81.00	132.78	!	179.35
Average Cost/year = \$87.75										

SUBPROJECT BUDGET (000)

EXAMPLE 2 : GENOTYPE/ENVIRONMENT INTERACTION IN BROAD BEAN

	FY 90		!	FY 91		!(AID)	TOTAL FY		!GRAND TOTAL	!GDE in kind
	\$	LE		\$	LE		\$	LE		
Compensation		51.60	!		54.18	!		105.78	!	66.00
Equipment	20.00		!	10.00		!	30.00		!	
Training	10.50		!	-		!	10.50		!	
Tech. Assist.	-		!	6.00		!	6.00		!	
Travel	10.00		!			!	10.00		!	
Supplies	5.00	3.00	!	5.00	3.00	!	10.00	6.00	!	
Facilities		5.00	!		5.00	!		10.00	!	6.00
Information		3.00	!		2.00	!		5.00	!	10.00
Others		3.00	!		3.00	!		6.00	!	
TOTAL	45.50	65.60	!	21.00	67.18	!	66.50	132.78	!	153.00
Average Cost/year = \$76.5										

EXAMPLE OF COMPUTER-BASED TECHNOLOGY SUBPROJECT BUDGET \$ (000)

	FY 88		!	FY 89		!	FY 90		!(AID)	TOTAL FY		!GRAND TOTAL	!GDE in kind
	\$	LE		\$	LE		\$	LE		\$	LE		
Compensation		79.50	!		79.50	!		79.50	!		238.50	!	89.20
Equipment	30.00		!	20.00		!			!	50.00		!	
Training	5.00		!	5.00		!			!	10.00		!	
Tech. Assist.	5.00		!	5.00		!			!	10.00		!	
Travel	5.00		!	5.00		!			!	10.00		!	
Supplies	1.00	2.00	!		2.00	!	2.00	2.00	!	1.00	6.00	!	10.00
Facilities			!			!			!			!	20.00
Information		3.00	!		2.00	!			!		5.00	!	
TOTAL	46.00	84.50	!	35.00	83.50	!	81.50	81.50	!	81.00	249.50	!	119.20
Average cost/year = \$90,000													

Financial Plan

1. Introduction:

STC is a non-revenue producing component which will finance research, development and engineering activities directed to specified priority development problems. Financing will be through an Egyptian management unit, the Project Secretariat, which will be responsible for problem selection, competitive RD&E project awards and technical/financial tracking of implemented subprojects.

Six problem areas have been selected for initial implementation. For purposes of the STC design, a number of RD&E subprojects have been conceptualized and these form the basis for the administrative and financial plans. This analysis explains and discusses of the cost models employed. The cost effectiveness of the STC design is treated in Annex G.

2. National and Local/Regional Problems:

Subprojects in these elements may involve any scientific discipline and range in funding from small (\$25,000 - 50,000) to large (\$1 million and above). The conceptual projects reflect a modest spread of size.

Four topics were "budgeted" as typical subproject activities, two each in the national and local/regional categories; industrial chemical production from local minerals, an engineering oriented activity with capital intensive, full scale implementation, construction materials, a process development effort which could be either small or medium production size, water and waste water treatment conceptualized as two or three teams of trained personnel to conduct tests and analyses of faulty operating treatment plants and, lake ecosystems, a project to do careful sampling, analysis and system planning for better economic use of northern and eastern saline lakes. These projects differ in their scope, organization and range of financial inputs.

3. Advanced Technology:

This area seeks to build Egyptian capacity in two topics: biotechnology and computer based systems. Specific problems will be addressed during STC implementation and again two projects were conceptualized; fermentation processing and computer process control. The advanced technology area differs from national and local problems in their training requirements and the equipment required to build Egyptian capacity.

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4. The cost Estimate Model for RD&E Projects:

Specific cost estimates for RD&E were used when available. Dollar costs were escalated at 3% for the first two years and 5% thereafter. Similarly, Egyptian pound costs were escalated at 25% for the first five years and 20% thereafter.

Budgets were prepared for each of six projects with at least eight cost elements for each budget (see Appendix to this Annex). Percentages of total subproject cost were calculated for each cost element and, when more than one subproject was available, averages were taken. These budgets are presented in Appendix K.1. They were prepared for FY 87 with local costs in L.E. at the conversion rate of \$1.00 = L.E.2.17. Exchange rate for subsequent years was escalated on the difference between the L.E. and dollar inflation rate respectively.

The design team then estimated the number of problems that could reasonably be expected to be implemented during the LOP. The nature of the problem area and the relevance of S&T to the area, time and effort required to effect detailed problem definition and R&P's, capacity of the Secretariat to process solicitations, and the capacity in Egypt to undertake applied R&D were considered.

The number of projects in each area and their approximate timing were then derived. It was arbitrarily decided to assign subprojects as either large or small with the latter being one half of the former. With a "schedule" of subprojects, unit size and subproject element costs could be calculated from the percentages available. The model was selective in that individual percentages were applied to national problems, to local problems and to each of the two advanced technology categories.

While this model is limited in its statistical validity, the underlying "budgets" are felt to be representative of a typical RD&E subproject in these topic areas. The level of effort and suggested number of subprojects (approximately 50-60 over a six year period) is consistent with Egyptian S&T capacities.

5. Supporting Services:

The Supporting Services to STC consist of:

- a) The Egyptian Management Services
- b) Information Services provided by ENSTINET
- c) The Technical Support Services, which will be administered by USAID

The budget for these services is attached in Appendix.

a) The Egyptian Management Services (EMS):

EMS will be provided by the Project Secretariat and the Steering Committee. Project Secretariat will be formed by full-time Egyptian personnel who will be contracted by the Steering Committee. Project funds will be made available to contract on a full-time basis, the Executive Director, four managers, ten technical staff (including technical liaison officer) as well as four secretarial and administrative staff. The services will be retained during the LOP for a total of 133 manyear.

The salary of each project secretariat member was derived from the compensation plan used by USAID/Cairo for its foreign service national staff. The starting yearly salary of the Executive Director is L.E. 24,000 (\$11,000), the manager's salary is L.E. 18,000 (\$8,300) and the technical staff is L.E. 12,000 (\$5,500).

In addition to the Project Secretariat staff, the Project Secretariat will be able to draw upon the services of ASRF employees for accounting, contractual and administrative purposes. A compensation scheme was derived on the basis of L.E. 173,600 per year (\$80,000). These funds will cover incentives and honorari to the members of the Steering Committee for approximately 20-25 staff during the LOP at a monthly rate of L.E. 200 (\$92) per month. This incentive payment represents approximately 100% of the basic salary of an average GOE employee.

The Project Secretariat will also hire the services of U.S. consultants on a host country PSC in order to assist the Steering Committee in preparing the relevant policy studies for SIC. An estimate of approximately 6 mn of level of effort is required, with a monthly rate of \$12,000. This includes salaries, international travel, per diem as well as miscellaneous expenses.

b) Information Services provided by ENSTINET:

The information services provided by ENSTINET will be managed by the central coordinating group at ASRF. This group is staffed with approximately 10 full-time, highly trained information and computer system engineers.

The component will bear 50% of the salary cost of the ENSTINET central coordinating group which will gradually decrease to 25% in FY 92 and 93. It is expected that ENSTINET will cover its remaining salary cost from the services it will provide to other clients in the S&T community. Salaries were derived from the FSN compensation plan.

U.S. consulting assistance is intended to keep ENSTINET abreast of latest technological and service trends and products and to facilitate access to and procurement of these products. The amount requested is equivalent to about 4 mn and was estimated at \$50,000 for FY 88.

A major portion of the ENSTINET budget is in the information search and access to foreign data bases and documents. The STC component will subsidize the foreign data base searches which were estimated at an annual figure of 4000 and cost of \$35/search totalling \$140,000 a year. However, as a result of use of optical disc technology, it is assumed that the cost per search request will decrease, thus allowing the number of subsidized search to be increased. Such expectation is realistic in view of the geographical extension of ENSTINET services to the local and national universities.

In addition, ENSTINET will be prepared to assist STC by building programatically oriented data bases of R&D projects, technical reports and scientific personnel. The budget for data base building has been estimated on the basis of 15,000 records per year at L.E. 15 per record - totally L.E. 150,000 (\$69,000). Additional funds were also budgeted for data services and collection by external Egyptian information groups.

An amount of \$200,000 was also budgeted for in order to procure computer software and hardware for the local universities which will be part of the ENSTINET nodes. A micro-computer (AT&T, 3 B2) with associated software and hardware cost approximately \$25,000.

c) Technical Support Services:

Project funds will be retained by USAID/Cairo to provide the following services:

- Management System Contractor to assist the Project Secretariat in different functions.
- Monitoring the STC component.
- Evaluation and audit.

- Management System Contractor:

As explained in section VI.C.2 of the PP, a managerial system contractor will provide 18 months of services to the Project Secretariat. It is estimated that a total of 38 mm of effort will be provided by the 8(a) firm. Basic salaries were estimated at \$261/day with a field overhead of 60% of total salary, or G&A of 16% and a fee of 7%. In addition, funds were made available to the management system contractor to establish an office in Cairo for 18 months with appropriate administrative and secretarial staff.

- USAID Monitoring Services:

As indicated in section VI.C.2.b. of the PP, USAID will contract the services of a Foreign Service National (FSN) project specialist and a secretary to assist the project officer in its monitoring activities.

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The starting salaries of the project specialist and the secretary are L.E. 27,000 (\$17,500) and L.E. 7,200 (\$3,300) respectively. These salaries are consistent with the FSN compensation plan at USAID/Cairo. It is expected that FSN services will start in FY 88 and will last for seven years.

In addition, USAID will be contracting the services of U.S. short-term consultants to analyze new problem areas and conduct policy studies. A level of effort of 20 mm was estimated at \$12,000/mm.

IQC for Evaluation and Audit:

Two Indefinite Quality Contractors (IQC) will also be retained for evaluation and audit. The IQC budget for the Component's mid and final evaluation was estimated on the basis of a total 17 mm over a period of 2.5 months. The IQC multipliers for the contractor staff and for the consultants were estimated at 2.7 and 1.7 respectively.

The IQC budget for audit was estimated on the basis of 6 mm of effort using a multiplier rate of 3.0.

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ILLUSTRATIVE STD BUDGET
1. NATIONAL RESEARCH PROGRAMS \$10000

ANNEX K
APPENDIX I

Item	FY 87		FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		FY 94		SUBTOTAL		TOTAL
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	
Research Grants	0	0	17	120	71	465	178	983	221	1,175	176	947	103	630	60	480	828	4,745	5,573
Participation Training					39		67		67		46		26		9		245		245
Equipment Supplies			76	12	277	61	821	122	1,809	132	730	95		27			3,930	452	4,382
TOTAL	0	0	115	132	380	466	1,066	1,116	2,052	1,307	1,152	1,045	129	657	69	480	5,003	5,197	10,200
Commitment Expenditures	0	0	115	132	495	598	1,561	1,708	3,653	3,015	4,865	4,060	4,934	4,717	5,003	5,197	5,003	5,197	10,200
USE			Salaries		Customs fees		Facilities & Supplies		Training										Total
LE			1,700		1,750		600		60										4,200

ILLUSTRATIVE STD BUDGET
2. REGIONAL/LOCAL RESEARCH PROGRAMS \$1000

Item	FY 87		FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		FY 94		SUBTOTAL		TOTAL
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	
Research Grants Personnel			75	366	65	559	106	244	132	1,062	122	1,100	73	839	43	502	576	5,292	5,858
Participation Training			9		45		55		63		62		35				270		270
Equipment Supplies			120	16	266	24	415	29	414	34	410	29	315	22		16	1,940	172	2,112
TOTAL	0	0	164	384	377	583	576	273	609	1,116	594	1,129	423	841	43	518	2,786	5,464	8,250
Commitment Expenditures	0	0	164	384	541	957	1,117	1,240	1,726	2,536	2,320	4,385	2,743	4,946	2,786	5,464	2,786	5,464	8,250
USE			Salaries		Customs fees		Facilities & Supplies		Training										Total
LC			2,600		75		726		22										4,100

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ILLUSTRATIVE BUDGET
 3. ADVANCED TECHNOLOGY
 3.A: COMPUTER BASED TECHNOLOGY \$1000

Item	FY 87		FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		FY 94		SUBTOTAL		TOTAL \$
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	
Research Grants/ Personnel			95	90	26	305	65	358	64	365	126	373	67	202	43	132	561	1,833	2,394
Participant Training			25		70		69		68		67		17				320	0	320
Conferences/ Equipment/ Supplies			565	6	302	21	605	21	124	24	376	26		18		12	1,733	128	1,861
TOTALS	0	0	485	96	458	326	759	379	276	392	53	404	104	220	43	144	2,614	1,961	4,575

3.B: BIOTECHNOLOGY & GENETIC ENGINEERING \$1000

Item	FY 87		FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		FY 94		SUBTOTAL		TOTAL \$
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	
Research Grants/ Personnel					76	304	65	343	65	354	44	220	173	243	128	264	631	1,728	2,359
Participant Training					133		131		94		35		22		34		479	0	479
Conferences/ Equipment/ Supplies					341	21	1,210	21	326	29	58	17	979	19	61	12	2,788	119	3,107
TOTALS	0	0	0	0	570	325	1,437	364	527	365	137	237	1,204	262	223	276	4,098	1,847	5,945

TOTALS ADVANCED TECHNOLOGY

Total expenditures			143	96	1,029	651	2,156	743	603	775	418	641	1,308	482	266	420	6,712	3,808	10,520	
Discretionary expenditures	0	0	663	96	1,471	747	3,657	1,490	4,370	2,265	3,135	2,706	6,446	3,388			6,712	3,808	10,520	
LE			Salaries		Dues/fees		Facilities & Supplies		Training		Total									
			1,500		2,150		650		50		4,850									

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ILLUSTRATIVE STL BUDGETS
4. EGYPTIAN MANAGEMENT SERVICES (\$10,000)

Item	FY 87		FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		FY 94		SUBTOTAL		TOTAL		
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	\$		
Salaries	0		65		30	207	20	239	20	244		237		244		302	70	1,658	1,728		
Travel	5		35		43		43		44		53		56		33			320	320		
Participant Training	12		11		3		3		3		3		3		3			41	0	41	
Materials (Equip. Supplies)		51		117		56		8		8		6		8		8		117	155	272	
Stipend (Tech. Serv. Meetings/Studies)				4		4		3		5		3		4		4			25	25	
				10		10		15		20		20		20		14		0	109	109	
TOTAL	12	56	126	190	33	372	23	311	23	324	3	321	3	332	3	361	228	2,267	2,495		
GRAND TOTAL																	Salaries-Training		Customs fees-facilities		Total
																	200		207		407

ILLUSTRATIVE STL BUDGETS
5. INFORMATION SERVICES (ENSTNET) (\$1000)

Item	FY 87		FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		FY 94		SUBTOTAL		TOTAL				
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	\$				
Indirect Services/Travel			56	67	60	63	44	62	44	61	21	38	21	33				245	324	570			
Info. Sci. Search/Retrieval			257	98	278	69	266	62	310	47	173	24	178	30				1,462	320	1,782			
Equipment (Supplies)			65		66		17		17		14		15					236	0	236			
Training Fee			25		23		22		20		11		10					112	0	112			
TOTAL EXPENDITURE	0	0	424	165	444	132	349	124	391	108	219	62	224	63				2,056	644	2,700			
Administrative Expenditures	0		579		1,160		1,633		2,152		2,415		2,700					2,700		2,700			
GRAND TOTAL																	Salaries		Customs fees-facilities		Information search		Total
																	350		330		330		1,010

* includes compensation, incentives, RDSE, consulting and local travel
 ** includes equipment, maintenance, data base fees and supplies
 *** includes travel and per diem

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LEADS FROM THE SDC ENDORS
 b. TECHNICAL SUPPORT SERVICES - ANNUAL

Category	FY 87		FY 88		FY 89		FY 90		FY 91		FY 92		FY 93		FY 94		SUBTOTAL		TOTAL
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	
Following Special Services	37	19	40	19	40	20	41	21	42	22	43	22	45	23	5	3	255	149	404
Net System Contractor	264		497		14		14		14		14		14		12		793	0	793
Evaluation of Audit	9	2	9	2	9	2	9	2	169	41	7	2	7	2	251	51	494	104	598
TOTAL	312	21	496	21	53	22	54	23	245	63	64	24	68	25	269	54	1,552	253	1,805
Net																			
			Salaries:		Customs fees		Facilities												Total
			50																50

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BUDGET - NATIONAL RESEARCH PROGRAMS
(1983)

<u>AREA/PROJECT</u>	<u>-Project-Year</u>							<u>Project Total</u>
	<u>FY87</u>	<u>FY88</u>	<u>FY89</u>	<u>FY90</u>	<u>FY91</u>	<u>FY92</u>	<u>FY 93</u>	
<u>Construction</u>								
Materials		185	237	159	82			663
Project			250	200	200	150		800
Project				250	200	200	150	800
Project					200	100	100	400
Project					200	100	100	400
<u>Industrial Chem.</u>								
Chem Process			300	263	199	192		954
Project				200	100	100		400
Project				250	200	200	150	800
Project					200	100	100	400
<u>Soils & New Areas</u>								
Soil Analysis			1129	378	394	207		2128
Project			200	100	100			400
Project				550	250	250	200	1250
Project				250	200	200	150	800
Project					200	100	100	400
=====								
<u>Totals</u>	0	185	2197	2600	2524	1793	950	13254
<u>New Project Starts</u>	0	1	4	5	4	0	0	
<u>Projects in Progress</u>	0	1	5	10	13	11	7	
<u>Total Number of Projects</u>								14
					<u>Average Cost</u>			732

SUPPROJECT - Construction Materials

Item	AID Funding										In kind
	FY 88		FY 89		FY 90		FY 91		Total		
	\$ (000)	LE (000)	\$ (000)	LE (000)	\$ (000)	LE (000)	\$ (000)	LE (000)	\$ (000)	LE (000)	
Compensation	0	68	0	142	0	150	0	78	0	438	100
Consultants	12	0	0	0	6	0	0	0	18	0	
Equipment	88	0	100	0	0	0	0	0	188	0	
Supplies	0	20	0	40	0	50	0	39	0	149	140
Training	10	2	0	0	0	0	0	0	10	2	
Information	0	2	0	1	0	1	0	1	0	5	
Local Travel	0	1	0	2	0	2	0	1	0	6	
Foreign Travel	14	0	0	0	3	0	0	0	17	0	
Facilities											70
Other											
Totals*	116	93	100	185	9	202	0	118	225	591	310
\$ Equivalent	185		237		159		82		663		

* Totals may not agree due to rounding.

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SUBPROJECT - Chemical Processing

Item	AID Funding										
	FY 89		FY 90		FY 91		FY 92		Total		In Kind
	\$ (000)	LE (000)	LE (000)								
Compensation	0	193	0	203	0	213	0	224	0	932	191
Consultants	16	2	16	2	0	0	0	0	32	0	
Equipment	150	0	50	0	0	0	0	0	200	0	
Supplies	0	40	0	50	0	50	0	36	0	178	173
Training	20	0	0	0	0	0	0	0	20	0	
Information	0	5	0	2	0	2	0	2	0	11	
Local Travel	0	3	0	3	0	3	0	3	0	12	
Foreign Travel	16	0	6	0	0	0	0	0	22	0	
Facilities											115
Other											
Totals*	232	241	72	258	0	269	0	259	274	1323	477
\$ Equivalent	380		263		199		192		1333		

* Totals may not agree due to rounding.

SUBJECT - Soil Characterization

<u>Item</u>	AID Funding										
	FY 89		FY 90		FY 91		FY 92		Total		In Kind
	\$ (000)	LE (000)	LE (000)								
Compensation	0	173	0	445	0	466	0	244	0	1329	391
Consultants	0	0	0	0	0	0	0	0	0	0	0
Equipment	040	0	0	0	0	0	0	0	040	0	0
Supplies	10	0	10	0	10	0	5	0	35	0	0
Training	0	0	0	0	0	0	0	0	0	0	0
Information	0	4	0	2	0	2	0	3	0	11	0
Local Travel	0	25	0	50	0	50	0	25	0	150	0
Foreign Travel	0	0	0	0	0	0	0	0	0	0	0
Facilities											05
Other (vehicles)	133	0	0	0	0	0	0	0	133	0	0
Total*	980	202	10	497	10	518	5	272	1285	1499	391
\$ Equivalent	1129		378		394		207		2193		

* Totals may not agree due to rounding.

BUDGET - REGIONAL/LOCAL RESEARCH PROGRAMS
(6000)

AREA/PROJECT	Project Year							Project Total
	FY87	FY88	FY89	FY90	FY91	FY92	FY 93	
<u>Lake Ecology</u>								
Lake 1	24	276	202	22				474
Lake 2		70	235	213	25			403
Lake 3			24	244	224	26		518
Lake 4				25	253	235	27	510
<u>Small Industry</u>								
Furniture		25	100	50				175
Milk Process.			200	100	100			400
Cheese Mfg.				200	100	100		400
Project				25	100	50		175
Project					25	100	50	175
Project					25	100	50	175
<u>Water/Waste Water</u>								
Team 1		41	147	92	25			305
Team 2			41	147	92	25		305
Team 3				41	147	92	25	305
<u>New Areas</u>								
Project		200	100	100				400
Project			200	100	100			400
Project				250	200	200	150	600
Project					200	100	100	400
<u>Totals</u>	24	570	1250	1610	1616	1028	402	6472
<u>New Project Starts</u>	1	4	4	5	3	0	0	
<u>Projects in Progress</u>	1	5	9	14	14	10	6	
<u>Total Number of Projects</u>								17
								<u>Average Cost</u> 381

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SUBPROJECT - Water & Waste Water

Item	AID Funding										In kind
	FY 88		FY 89		FY 90		FY 91		Total		
	\$ (000)	LE (000)	\$ (000)	LE (000)	\$ (000)	LE (000)	\$ (000)	LE (000)	\$ (000)	LE (000)	
Compensation	0	42	0	115	0	121	0	32	0	310	71
Consultants	0	0	0	0	0	0	0	0	0	0	0
Equipment	0	0	44	0	0	0	0	0	44	0	
Supplies	0	0	15	0	0	0	0	0	15	0	
Training	0	2	0	0	0	0	0	0	0	2	
Information	0	2	0	1	0	1	0	0	0	4	
Local Travel	0	9	0	3	0	3	0	1	0	16	
Foreign Travel	0	0	0	0	0	0	0	0	0	0	
Facilities	0	0	0	0	0	0	0	0	0	0	43
Other											
Totals*	0	55	59	119	0	125	0	33	59	332	114
\$ Equivalent	41		147		92		25		325		

* Totals may not agree due to rounding.

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SUBPROJECT - Lake Ecosystems

AIF Funding

Item	FY 87		FY 88		FY 89		FY 90		FY 91		LE (000)
	\$ (000)	LE (000)									
Compensation	0	15	0	250	0	271	0	15	0	500	125
Consultants	6	0	0	0	0	0	6	0	12	0	
Equipment	0	0	19	0	0	0	0	0	19	0	5
Supplies	0	0	10	0	0	0	0	0	10	0	3
Training	0	0	0	0	0	0	0	0	0	0	
Information	0	5	0	2	0	2	0	2	0	12	
Local Travel	0	0	0	6	0	0	0	0	0	6	
Foreign Travel	3	0	0	0	0	0	3	0	6	0	
Facilities	0	0	0	0	0	0	0	0	0	0	79
Other											
Totals*	9	20	29	266	0	273	9	17	47	577	215
\$ Equivalent	24		226		202		22		474		

* Totals may not agree due to rounding.

BUDGET - COST & PROJECT SECRETARIAT
(000)

ITEM	project year								GGE							
	FY87		FY88		FY89		FY90		FY91		FY92		FY 93		Total	In Kind
	\$	LE	\$	LE	\$	LE	\$	LE	\$	LE	\$	LE	\$	LE	\$	LE
Equipment	100													100		
Training	20	20												20	20	
Special Studies	135		135		135		135		135					675	155	
Supplies	10		5		5		5		5		5		5	40		
Facilities																100
<u>Staff</u>																
Exec. Dir.	15		30		32		33		35		36		38		219	
Managers (4)	10		81		85		89		93		98		103		559	
Staff (13)*	17		205		216		257		270		284		298		1540	
Secretary (5)	5		35		37		39		41		43		45		245	
Secr./Clerks (6)	2		24		25		27		28		29		31		167	
<u>Consultants</u>																
Computer	4		18		5										27	
Review (16)																
Proposals	6		7		10		8									
Reports			3		4		7		8		7		6		36	
<u>Comm. Mtgs.</u>																
	5		5		4		3		3		3		4		26	
Totals	120	230	519	557	603	618	505	530	120	3561	235					
\$ Equivalent	290	405	412	445	458	374	393	2758								

* 2 additional technical liaison agents added in FY 90

STC COMPENSATION SCALES FOR BUDGET PURPOSES

LE

Hourly Rate

<u>Title</u>	<u>FY 86</u>	<u>FY 87</u>	<u>FY 88</u>	<u>FY 89</u>	<u>FY 90</u>	<u>FY 91</u>	<u>FY 92</u>	<u>FY 93</u>
Professor	10.00	10.50	11.03	11.58	12.15	12.76	13.40	14.07
Assoc. Professor	8.50	8.93	9.37	9.84	10.33	10.85	11.39	11.96
Lecturer	7.00	7.35	7.72	8.10	8.51	8.93	9.38	9.85
Asst. Lecturer	4.00	4.20	4.41	4.63	4.86	5.11	5.36	5.63
Graduate Asst.	2.50	2.63	2.76	2.89	3.04	3.19	3.35	3.52
Technician	2.00	2.10	2.21	2.32	2.43	2.55	2.68	2.81
Secretary	3.50	3.68	3.86	4.05	4.25	4.47	4.69	4.92
Secretary/Clerk	2.00	2.10	2.21	2.32	2.43	2.55	2.68	2.81

University & Research Institute staff assumed to work 3 days (24 hr.) a week "full time" or 120 hr. per month - secretaries 160 hrs. per month.

Monthly "Salary"

	<u>FY 86</u>	<u>FY 87</u>	<u>FY 88</u>	<u>FY 89</u>	<u>FY 90</u>	<u>FY 91</u>	<u>FY 92</u>	<u>FY 93</u>
Professor	1000	1050	1103	1158	1216	1276	1340	1407
Assoc. Professor	850	893	937	984	1033	1085	1139	1196
Lecturer	700	735	772	810	851	893	938	985
Asst. Lecturer	400	420	441	463	486	511	536	563
Graduate Asst.	250	263	276	289	304	319	335	352
Technician	200	210	221	232	243	255	268	281
Secretary	560	588	617	648	681	715	750	788
Secretary/Clerk	320	336	353	370	389	408	429	450

SUBPROJECT BUDGET (\$000)

EXAMPLE 1: MODULATION CENTER/SEN 3

	FY 88		!	FY 89		(AID)	TOTAL FY		GRAND TOTAL	COE in kind
	\$	LE		\$	LE		\$	LE		
Compensation		51.00	!		54.18	!		105.78		55.00
Equipment	20.00		!	10.00		!	30.00			
Training	10.50		!	10.50		!	21.00			
Tech. Assist.			!			!				
Travel	10.00		!	10.00		!	20.00			
Supplies	5.00	3.00	!	5.00	3.00	!	10.00	6.00		
Facilities		5.00	!		5.00	!		10.00		
Information		3.00	!		2.00	!		5.00		
Others		3.00	!		3.00	!		6.00		
TOTAL	45.50	67.50	!	35.50	67.18	!	81.00	132.78	177.38	
Average Cost/year = \$83.75			!			!				

SUBPROJECT BUDGET (\$000)

EXAMPLE 2: REMOTIVE ENVIRONMENT INTERACTION IN BROAD BEAN

	FY 90		!	FY 91		(AID)	TOTAL FY		GRAND TOTAL	COE in kind
	\$	LE		\$	LE		\$	LE		
Compensation		51.00	!		54.18	!		105.78		55.00
Equipment	20.00		!	10.00		!	30.00			
Training	10.50		!	-		!	10.50			
Tech. Assist.	-		!	5.00		!	5.00			
Travel	10.00		!			!	10.00			
Supplies	5.00	3.00	!	5.00	3.00	!	10.00	6.00		
Facilities		5.00	!		5.00	!		10.00		5.00
Information		3.00	!		2.00	!		5.00		10.00
Others		3.00	!		3.00	!		6.00		
TOTAL	45.50	67.50	!	21.00	67.18	!	66.50	132.78	153.00	82.00
Average Cost/year = \$76.5			!			!				

EXAMPLE OF COMPUTER-BASED TECHNOLOGY SUBPROJECT BUDGET \$ (\$000)

	FY 88		!	FY 89		!	FY 90		(AID)	TOTAL FY		GRAND TOTAL	COE in kind
	\$	LE		\$	LE		\$	LE		\$	LE		
Compensation		79.50	!		79.50	!		79.50	!		238.50		89.20
Equipment	30.00		!	20.00		!			!	50.00			
Training	5.00		!	5.00		!			!	10.00			
Tech. Assist.	5.00		!	5.00		!			!	10.00			
Travel	5.00		!	5.00		!			!	10.00			
Supplies	1.00	2.00	!		2.00	!		2.00	!	1.00	6.00		10.00
Facilities			!			!			!				20.00
Information		3.00	!		2.00	!			!		5.00		
TOTAL	46.00	84.50	!	35.00	83.50	!		81.50	!	81.00	249.50	265.81	119.20
Average cost/year = \$90,000			!			!			!				

Egyptian Scientific and Technical Information Network

This section discusses the activity plans of the Egyptian National STI Network (ENSTINET).

ENSTINET is a public information system and service designed to assist Egyptian problem solvers and decision makers in accessing quality data and current information. ENSTINET is an open-ended, centrally coordinated, network of sectoral information service organizations ("nodes") currently providing information services in six sectors: agriculture; development and reconstruction; energy; health care; industry; and science/technology. The coordinating function is performed through a central ENSTINET office at the ASRI and concerned with Network policies and operations, advanced planning, manpower development, and with national and international representation of ENSTINET's interests.

At present ENSTINET emphasizes database-oriented functions and services, including the following: a) development and maintenance of national and sectoral databases containing S&T data and literature generated in Egypt; b) facilitation of efficient access to recorded knowledge in electronic and traditional forms, in Egypt and abroad; c) marketing of information services; d) educating the Egyptian public regarding the value and availability of problem-solving data and information; and e) training of professional manpower.

I. Pre Component Activities:

During the pre component activities, ENSTINET proposes to continue its current public information services, with certain modifications described below. The ENSTINET central group, institutionalized in the ASRI, will continue to perform its leadership and coordination role on behalf of the Network membership. In particular, the central group will assume the function of guiding the technological development of the Network, by maintaining constant awareness of the latest developmental trends in information and database technologies, and passing this awareness to the Network members. For this purpose, the central group will maintain efficient communication with the U.S.

During this 21-month period, ENSTINET shall establish two regional access points to the Network and its services: one at the University of Alexandria Research Centre, and the other at Suez Canal University. These two regional access points will be provided with computer and communications equipment affording them to utilize the database search services provided by via ENSTINET nodes, as well as document delivery services. ENSTINET will train professional and paraprofessional personnel in these two locations.

These "information extension service" staffs will be qualified to interview information users in these regional communities, generate a search statement

or search profile, and forward a search request via computer telecommunications to the ENSTINET node where the online search will be executed. The output of the search shall be mailed directly to the regional service. The records of the regional library collection will be added to the ENSTINET union list of foreign periodicals, and contact with the British Library Lending Division will be established as well. The regional extension services will collect fees for database searches, and will be expected to cover their personnel and operating costs from this income.

ENSTINET will also absorb the functions of the industry information node at EIDLIC, and the energy information node at OEP. as established under the Applied S&T Project.

ENSTINET will modify the mode of subsidy of the foreign database search services. Sectoral information service nodes will be requested to attempt to cover the full or partial hard currency costs of foreign database searches from other AID-sponsored activities in their sector, provided of course that such activities and funds exist. In addition, realizing that some of the sectoral nodes are making slight profit on database searches whose cost is subsidized by ENSTINET, these nodes will be requested to share a part of this income with the network coordinating group. The net financial result of these modifications is not possible to evaluate at this time; the intention is, however, to have the modified economics of ENSTINET services and subsidies in effect by the beginning of the SIC.

In seeking to shift more of the fiscal responsibility for ENSTINET services to the Network membership, ENSTINET must continue offering the sectoral nodes concrete benefits that they consider sufficiently valuable for retaining Network membership and active participation. Clearly, the hard currency aid is appreciated most, as without it ENSTINET would not be able to operate its foreign search services. In keeping with this essential point ENSTINET proposes to cover the maintenance costs of the nodes' hardware and software during the first phase.

II. ENSTINET Activities under SIC:

ENSTINET will continue its primary national function as a public information service for problem solvers and decision makers concerned with the country's socio-economic development. Within this broad mandate, ENSTINET shall endeavor to provide information services particularly to the Science and Technology Cooperation (SIC) program community. The SIC program will be able to contract with ENSTINET for certain services, both long-term (such as database searching and current awareness) and of shorter duration (such as development specialized databases).

The overall goal is to strengthen the existing, database oriented activities; gradually include more sophisticated, information analytic functions; and begin supporting informal communication among members of the problem solving community through selected application of electronic mail. In this manner, ENSTINET will become a value-added public information utility, the highest form of public information systems.

1. Geographical Extension of ENSTINET Services:

ENSTINET will continue the geographical extension of its services, begun in Phase I, to six other Egyptian universities. These "information extension services" will extend the database-search and document-delivery functions of ENSTINET into regional user communities.

The ENSTINET coordinating office will provide the impetus and planning of information extension services in the regional universities. They are to be staffed by at least one full-time professional person trained by ENSTINET, and supported by a personal computer system with communications capability. Staff training will be carried out by personnel of the central coordinating group of ENSTINET; the training cost is covered in the "Management Cost" component of the budget request.

Independently, the sectoral information service nodes should foster a parallel development of extension units in large sectoral agencies and firms around the country; here ENSTINET's involvement would consist only in guidance and training, again by the central coordination group.

2. Access to Foreign Databases and Documents:

Continuation of the successful online database search service is essential. ENSTINET must be prepared to respond to major changes that are beginning to occur in the database industry, specifically to the alternate mode of database distribution on optical discs.

In the early Phase of the component, the ENSTINET coordinating group, working with a U.S. consultant, will conduct an extensive examination of the role of the optical disc as medium for distribution and use of public databases, and propose an action plan to integrate this medium systematically into ENSTINET. The budget estimates for such an integration are based on an anticipated procurement of ten CD-ROM database licenses with associated hardware. The availability of CD-ROM databases in Egypt will also be exploited by the current awareness service offered through ENSTINET nodes.

The technological and geographical diversification in ENSTINET will require that the accounting systems currently in effect be modified. ENSTINET intends to monitor the subsidized foreign database searches centrally, so as to distribute the subsidy equitably among the different user communities.

The cost of document provision and procurement has been passed by ENSTINET to the end user. This arrangement should continue.

3. Building Egyptian Databases:

Because of the upcoming changes in the mechanism of distribution of electronically recorded information, ENSTINET's sectoral information service nodes may expect to become, over the next decade, primarily database producers and only secondarily database searchers, hence reversing their present

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emphases. ENSTINET's future will heavily depend on its ability to build and maintain databases, and provide more sophisticated information services to an increasingly demanding clientele.

ENSTINET will continue to foster the systematization of the Egyptian bibliographic database begun in 1985 and move aggressively into generating other types of databases (non-bibliographic). Rather than rely on the sectoral information service nodes to produce such databases, ENSTINET will use more direct approaches (producing databases inhouse, or subcontracting with organizations specializing in data collection). It should be appreciated that each database presents different sets of problems regarding data availability, integrity, currency, etc.

4. Electronic Mail:

National S&I information systems have been invariably document oriented. ENSTINET differs from them in that it is a network of information services, not resources, and in possessing a physical network of computers and communications capable of accomodating other, value-added services to its clientele.

At the outset of the SIC component, ENSTINET coordinating office, working together with a U.S. consultant, will carry out a study leading to design of an application of electronic mail in the Network. The study will outline a two-year sectoral experiment with two facets of "electronic mail" E-mail: a) text mail, a person-to-person communication system that allows ENSTINET users to mail digital text messages, files and the like to other named users; and b) an electronic bulletin service, a means of electronic "broadcasting" of messages to ENSTINET users grouped according to common areas of interest, occupation, activities, etc. The deliverables in this pilot application are: installation of E-mail software; controlled operation of the two E-mail services in two sectors; and evaluation of the experiment.

The extension of ENSTINET's function into the E-mail area presupposes that Egypt will install and operate, separate from ENSTINET, a public data network. Present indications are that such a network will be operational in two to three years.

Financial support will be provided for the two-year pilot experiment, in the form of consulting services and telecommunications charges supporting the user of the public data network. Based on the results of the pilot use of E-mail, ENSTINET may recommend its broader implementation in all sectors, on a self-supporting basis; the value-added service based on E-mail should generate sufficient income for ENSTINET to cover its operating costs.

The electronic mail services are important for ENSTINET because of the extension of the science communication process, and the generation of income by sectoral information services. The computer systems in the nodes were procured in 1984, and their cost effectiveness will continue to decrease (in comparison with latest technology). It is, therefore, essential that the capacity of these machines be used to their maximum, so as to generate an income capable of covering their maintenance.

5. Sectoral Extension of ENSTINET

At present ENSTINET encompasses six sectors, and is likely to undergo a consolidation that may reduce the number to four. At the same time, several other disciplines and sectoral communities are not being served by ENSTINET, and should be included in the network: a) social sciences and humanities; b) planning; c) education (aside from educational research); and d) economics and management.

It is proposed that three new sectoral information service nodes be added to the STI Network during the LOP. Based on empirical experience, the time required to build an operational node in each of these areas is approximately 18 months. The node-building activity is the responsibility of the ENSTINET coordinating office, working with the appropriate sectoral agency. It is assumed that the ENSTINET coordinating group will contribute personnel services to assist in the selection of the sectors' nodes, and in training their personnel. The respective sectors will be expected to subsidize the costs of implementation, as well as the costs of operating these services. Once they are operational, ENSTINET will extend to them the subsidy for foreign database searches.

6. ENSTINET Management Component:

Extending over all activities described above is the Network management and technical effort by the central coordinating group at the ASKT, staffed with approximately 10 fulltime, highly trained information and computer systems engineers. Vis-a-vis the ENSTINET member nodes, this staff provides the planning and coordination of the Network services, the technical systems support required by new services (such as the introduction of optical discs), the troubleshooting in systems and procedures, software development or modification, and assistance in service marketing. This group will also be responsible for training, selection and procurement of equipment, and for monitoring regional extension services. The coordination group is a sine qua non of ENSTINET.

U.S. consulting assistance is intended to keep ENSTINET abreast of technological and service trends and products, facilitate access to and procurement of these products, assist with equipment and software installation, help guide the overall development of the Network by optimally absorbing the appropriate elements of these trends and products, and respond effectively to the ongoing transformation of the global information sector. Consulting assistance is to cover the sectoral nodes' needs as well.

The intention is to shift the Network economics so as to have the sectoral information service nodes contribute toward covering the cost of the coordinating group, by sharing a portion of their profits from foreign database searching. This contribution, however, may be on the order of perhaps LE 25,000 per year, thus constituting only a fraction of the annual operating costs of the group.

Waivers

Waiver No. 1

Subject: Waiver to permit payment of incentives to selected GOE employees.

Problem: Mission order 3-10 prohibits the payment of incentives to the GOE employees of the cooperating entity (ASRT). Consequently, a waiver of Mission Order 3-10 dated December 12, 1978, as amended, is required to permit payment of compensation and incentives to the members of the Steering Committee, the Project Secretariat and its technical and administrative units.

Discussion: The management plan of the STC component calls for establishing a Steering Committee (composed of representatives of universities, research centers and public and private sectors entities) as well as the Project Secretariat and its five supporting units. These units are the R&D advisory panels, and offices for technical liaison, training and staff development, information and administrative services.

ASRT is planning to contract for the positions of the Secretariat executive director and senior managers of these five units. They will be employed full-time and solely for the S&T Cooperation Project. These individuals will be paid a regular salary from project funds with the understanding that they are not regular employees of the cooperating entity (ASRT). If they are current ASRT employees, however, they will be placed on a leave of absence without pay for the period they are contracted to provide services under the Project. As these individuals will not be considered active GOE employees while working on the project, Mission Order 3-10 is not applicable to them and no waiver is needed to provide these people a salary.

In addition to senior management, ASRT will contract the services of employees from ASRT, governorates and universities to perform duties related to administrative, technical, information and management functions. These people will be seconded to the project because they are needed in their present positions or their functions and responsibilities do not require them full-time at STC.

Since these people will perform duties which are additional to their normal job functions, ASRT requests they receive compensation or incentives from project funds for the time they donate to the project. A waiver of Mission Order 3-10 is needed to permit payment of incentives to these government employees.

The GOE has an existing incentives arrangement applicable to these employees. However, the policy the GOE uses does not differentiate between minor and

major levels of effort to an activity. As all staff receive the same compensation, this arrangement provides no real incentives to the different technical and administrative personnel.

Payment of incentives under the existing GOE incentives arrangement is through the use of GOE funds in the AID Special Account. This has proven to be unpractical, unreliable and ineffective. In two previous AID projects, Applied S&T Research and Technology and University Linkages, incentives payments through the normal GOE budgetary process was usually delayed by a year, involved the approval of four Ministries (MPIC, Planning, Finance and Economy) and required more than 18 bureaucratic steps to provide funding.

If a waiver of Mission Order 3-10 is approved, we will specify the management/advisory services required and the incentives payment arrangement in a PIL to the Project Secretariat. This will ensure that Egyptian staff receive their compensation on a regular basis.

The formulation of policies and rules governing the payment of incentives which are in form and substance acceptable to USAID will be a condition precedent to disbursement of AID's dollar financing for this project. The total amount of the incentives proposed to be paid to Egyptian government employees over the 8-year LOP will be Egyptian pound equivalent to \$640,000; or \$80,000 per year. This amount includes compensation, incentives, local travel expenses and per diem. HRDC/S&T believes that the payment of incentives will greatly promote project progress, especially as the program expands to include the governorates.

Payments for procuring services of employees of Egyptian entities cooperating in USAID activities are described in Mission Order 3-10 to protect AID from charges of favoritism or seeking undue policy influence. Mission Order 3-10 recognizes, however, that Egyptian government employees may be in the best position to carry out activities which AID wishes to support for programmatic reasons. Therefore, certain conditions are set under which payment can be made to government employees for work which is in addition to their normal responsibilities. These conditions are:

- activity is of high priority in the U.S. Government;
- b) The participation of government employees is an overwhelming necessity; and
- c) Payment for the services of government employees is accomplished in the shortest amount of time consistent with the nature of the task.

The proposed component meets these conditions:

- 1) The S&T Program is the second highest priority in the U.S. technical assistance portfolio in Egypt, as stated in the CDSS for the period of 1989-1993.

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- 2) Technical members of the Project Secretariat are expected to be university professors or managers in research centers, and all are government employees. Their participation is required for peer review and evaluating research proposals. GOE administrative and clerical staff are also required because GOE regulations forbid the use of non-GOE employees to be responsible for financial and contractual arrangements on behalf of a GOE agency.
- 3) GOE employees will be paid during the actual period in which they perform technical or administrative work. This is consistent with the project management system.

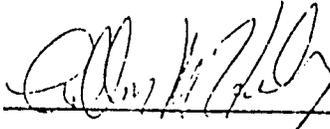
Furthermore, the payment of incentives to GOE employees fulfills the requirement set forth by AID/Washington in State 173326 dated June 7, 1987:

- 1) Payment is permitted under GOE laws and regulations set forth in the Presidential decrees No. 48 of 1982 and No. 175 of 1982.
- 2) ASRU has demonstrated that it cannot meet these incentive payments from its own resources and additional financing is required from the AID Special Account which is controlled by MPIC and the Ministries of Economy and Finance. In previous AID S&T projects, incentives taken from the Special Account took an average of three years from the time of starting the project.
- 3) The incentive payments are essential to achieve the technical and administrative work consistent with the project management system described in the project paper.
- 4) The GOE employees shall not receive duplicate payments for another service of the same activity. AID will closely monitor the incentive payments and will receive from the Project Secretariat the names, functions and activities for which incentives are paid.
- 5) The incentive rates and fees are in accordance with local standards as defined in the two Presidential decrees stated above. Incentive rates will be up to 200% of the basic salary if a researcher/or administrator is involved in a research project or up to 300% of the basic salary if he is involved in more than one research project.
- 6) As described below, all the proposed incentive requirements will carry out technical management and administrative support rather than local policy functions.
- 7) The Project Secretariat will be required to establish a mechanism and operating procedures for incentive payments. This is a condition precedent for disbursement.

Authority: According to Mission Order 3-10, only the Mission Director may approve an exception to the policy against payment of incentives, compensation, travel and per diem expenses to employees of cooperating Egyptian entities.

Recommendation: It is recommended that the Mission Director formally approve an exception to Mission Order 3-10 to permit payment of incentives to employees of Egyptian government entities participating in the SIC component. The life-of-project amount is not to exceed \$640,000. Payment will be based on rules and regulations governing such incentives, and will be subject to prior approval by USAID.

The Mission Director's signature in the space provided below will signify his approval.

Approved 

Disapproved _____

Date 7/7/87

Waiver No. 2

Subject: Request to waive Geographic Source from Code 941 to Code 899 for AID Local Cost Financing of Shelf Items.

Problem: Handbook 1B, Section 18 A.4.b., provides that shelf items having their origin in any country included in Code 899 but not in Code 941 are eligible for local cost financing if the price of one unit of such item does not exceed \$5,000. It also provides that the total amount of such shelf item purchases cannot exceed \$250,000 without obtaining a specific geographic source waiver. For the project component, it is estimated that total shelf items purchases of item having their origin in countries included in Code 899 but not in Code 941 will be approximately \$600,000.

Background: The STC Component has a total value of \$36 million. The major activity under this component is research in problem areas of national and local/regional dimension. This will include problem-solving projects using advanced methods such as computer-based technology and biotechnology. The research projects will be carried out in Egypt by a team of researchers and end-users. Experiments will be primarily on a laboratory scale, and, if successful, may be extended to a pilot scale. Some of the supplies/equipment anticipated for purchase include: raw materials for developing new construction materials; chemicals for industrial processing; supplies for small scale industry such as wood, chemicals and enzymes; fertilizers for the biotechnology programs; microprocessors or magnetic tapes; and software and hardware for the microcomputer-based technology program. All goods contemplated will be otherwise eligible for AID financing. It is anticipated that there will be a need to purchase spare parts in the local market for inoperable equipment already available at research centers and industrial firms which, if repaired, will save purchasing/replacing equipment.

Because of the nature of the STC Component activities, it is expected that there will be a continuing need for purchases in the local market (e.g., chemicals, supplies, enzymes, clays, cement and spare parts) so that research can be carried out in a timely and efficient manner. Based on previous experience in similar projects, we estimate the cost of locally procured materials and supplies for this component to total approximately \$1.0 million. Of this, \$600,000 will be from Free World countries (Code 899). In addition, we anticipate that some research project commodities, such as compressors, boilers and refrigerators may exceed the \$5,000 limit in unit price of imported shelf items (the unit customarily used when quoting prices). A \$10,000 limit on unit price is more appropriate for this type of procurement.

Authority: The Mission Director is authorized: (a) by paragraph 7(b) of Redelegation of Authority No. 653 to approve waivers of source and origin requirement without dollar limitation; and (b) by paragraph 11 of such Redelegation, the Mission Director may waive the \$5,000 unit price limitation for local cost procurements.

Recommendation: That you provide a geographic code waiver to permit the procurement of shelf items in code 899 countries up to \$600,000 and to increase the permissible unit price limit of such items to \$10,000.

The Mission Director's signature in the space provided below will signify his approval, and will be certifying, in accordance with ROA 653 para 7(b) (1), that: "Exclusion of procurement from free world countries other than the cooperating country and countries included in Code 941 would seriously impede attainment of U.S. foreign policy objectives and objectives of the foreign assistance program".

Approved 

Disapproved _____

Date 7/2/80

Waiver No. 3

Waiver of Advertisement in AID Procurement Bulletin

Subject: Request to waive the Requirement to Advertise in the AID Procurement Bulletin all Procurements Estimated under \$100,000.

Issue: The Mission Director's approval is required to waive the requirement to advertise in the AID Procurement Bulletin for all procurements which have an estimated value under \$100,000.

Background: Handbook 11, chapter 3, section 2.2.4, permits the use of informal solicitation procedures for procurements in which a contract does not exceed \$100,000. Handbook 11, Chapter 3, Section 2.3.1, states that procurements estimated to exceed \$25,000, but less than \$100,000, must be published in the AID Procurement Bulletin. Handbook 11, Chapter 3, Section 2.3.2, further states the requirement to advertise may be waived to avoid delay in project implementation, provided that efforts are made to secure bids and offers from a reasonable number of potential suppliers.

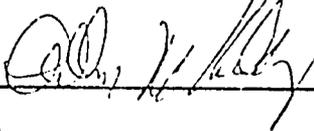
Justification: The commodities contemplated in the STC Component consist of small quantities of complex and custom-made equipment estimated to have a total value of \$8-9 million. This equipment will be purchased by a Procurement Service Agency (PSA) for approximately 60 subprojects divided among the national, local, regional and advanced technology programs. The procurement process will, therefore, be an ongoing process. Equipment lists, prepared by the principal investigators, will be sent to the PSA on a regular basis prior to and during the research period. Flexibility is necessary to allow the PSA to purchase and ship the equipment in the shortest time possible, permitting the research to be carried out on schedule. If individual advertising is to be performed for the 60 research subprojects, an additional 60-75 days will be required to process each advertisement.

Since much of the scientific equipment expected to be procured is of a complex and specialized nature, we propose that the PSA issue an annual advertisement in the AID Bulletin including an approximate list of equipment required. The list will be supplied by the Project Secretariat. The list will be general and there will be no specific advertisement for individual procurements under \$100,000 using these procedures. The PSA will keep a record of the suppliers that respond to the general advertisement. These firms will be solicited whenever the PSA receives the final equipment list.

Authority: The Mission Director is authorized, by paragraph 9 of Redlegation of Authority 653, to waive the requirement for advertising set forth in section 2.3.1 of Handbook 11, chapter 3, provided that such waivers shall be granted only where required to avoid serious delay in project implementation.

Recommendation: Pursuant to the foregoing discussions, it is recommended that you waive the requirement for advertising in the AID Procurement Bulletin for individual commodity procurements estimated at under \$100,000. If the estimated value of an individual commodity procurement is more than \$100,000, the notice of availability of procurement will be published in the AID Bulletin and the Commerce Business Daily.

Your signature in the space provided below will signify your approval.

Approval 

Disapproval _____

Date 7/7/87

Justification for Informal Competitive Procedures

Subject: Justification for Use of Informal Competitive Procedures under Handbook 11, chapter 3.

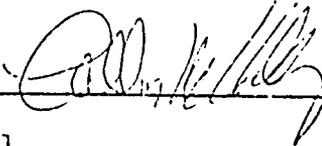
Background: Handbook 11, chapter 3, section 2.2.3a permits the use of informal competitive procedures (also known as competitive negotiation), if approved by the Mission Director, instead of formal competitive bidding when: (a) it is impossible to develop adequate specifications for use in an Invitation for Bids (IFB); (b) proprietary procurement is justified; and (c) if adherence to formal competitive procedure would impair project objectives. In any of these instances, a Request for Quotation (RFQ) may be approved for use instead of an IFB.

Justification: The scientific equipment that will be purchased for the research projects, with an estimated value of \$9.0 million, include specialized, complex and custom-made equipment such as spectrometers, quality control processors, micro and mini computers and pilot kilns for brick manufacturing. An illustrative list of equipment for the advanced technology program is attached. Competitive negotiated procedures are necessary for procuring these items because: (a) it is difficult to develop unrestrictive specifications for most of this equipment; (b) it is customary to allow the offerors in procurements for this type of equipment wide latitude to offer a variety of options that may result in significant cost savings; (c) precise equipment requirements may not be determinable in advance; some of the commodities will be used in an industrial process where samples must be tested to determine their compatibility with the existing equipment being used; (d) the quantity being purchased is small and is being purchased for research and testing purposes; and (e) current technology for scientific equipment, especially for computers and computerized mechanization, is undergoing dynamic change to the extent that it is not possible to develop unrestrictive specifications.

By using the negotiation process permitted by informal competitive procedures more accurate equipment specifications can be obtained. This will enable the Project Secretariat to weigh better the technical advantages and disadvantages of the various products offered and select a supplier accordingly.

Negotiated procurement, using the RFQ mode, was successfully used in two previous USAID S&T projects: the Applied S&T Research Project (263-0016) and the Mineral, Petroleum and Groundwater Assessment Program (263-0105). Both projects involved purchases of complex scientific and pilot plant equipment similar to the commodities to be purchased for the STC Component. In these projects the use of informal competitive procedures was obtained on a case by case basis. In both projects, the result of competitive negotiation procedures was appropriate equipment at a reasonable price.

Recommendation: It is recommended that you authorize the Project Secretariat, and its Procurement Service Agent, to use informal competitive procedures for the commodity procurements for the SIC Component in an amount not to exceed \$9.0 million based on the above justification. Your concurrence on the use of informal negotiated procurement procedures is indicated by your signature below.

Approval. 

Disapproval _____

Date 7/7/87

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Illustrative list of Equipment for Advanced Technology Program

I. Biotechnology:

- Microbiology laboratory:

Autoclaves, centrifuges, laminar flow bench, sterilization ovens, incubators, distillers.

- Soil analysis laboratory:

Ultra violet infra red spectrophotometers, shakers, calcimeters, glassware, hydrometers, furnaces and ovens, flamephotometers.

- Tissue culture laboratory:

Freezers, growth chambers, fluorescent-activated flow cytometers, fluorescent microscopes, tissue culture sterile hood, gama scintillation counters, chemical reagents and enzymes.

II. Computer Based Technology:

- Process Computer Control:

Process simulators, network analysers, micromachines software (real time programming packages), data loggers, logic analyzers, storage oscilloscopes, frequency synthesizers, transducers, measuring instruments.

- Computerized Production Management and CAD/CAM projects:

Computer work status, microcomputers with interaction graphic facilities, software packages, database modelling, natural language, expert systems and environment packages.

Implementation Schedule

The Schedule of major events is set out in the following table

<u>Action</u>	<u>Event</u>	<u>Responsible Party</u>	<u>Project Month</u>
1.	Pre Start up Activities Grant to ENSTINET	USAID/ASRT	- 6
2.	Project Paper Approved	USAID	- 3
3.	Congressional Notification	USAID	- 3 - 2
4.	Draft Pro Ag submitted to MPIC	USAID	- 2
5.	Advertisement for Executive Director*	USAID/ASRT	- 2
6.	PIC/1 for system contractor (SC) prepared*	USAID	- 1
7.	Pro Ag signed	USAID/MPIC	0
8.	PIL #1 issued	USAID	+ 1
9.	Initial CP for Disbursement met	USAID/ASRT	+ 2
10.	Selection of Executive Director	USAID/ASRT	+ 4
11.	Selection of System Contractor	USAID/SBA	+ 4
12.	Project Secretariat recruitment	SC	+ 1 - + 4
13.	1st Steering Committee meeting	SC	+ 5
14.	TRG for Project Secretariat (PS)	PS	+ 2 - + 5
15.	CP for Additional Disbursement met	USAID	+ 6
16.	RFP's for problem areas issued	PS	+ 9
17.	RFP for PSA issued	PS/SC	+ 9
18.	2nd Steering Committee meeting	SC/PS	+ 11
19.	Two information centers established	ENSTINET	+ 12
20.	Evaluation of proposals for research subprojects	PS	+ 12
21.	Evaluation of PSA proposals	PS	+ 13
22.	Annual Operating Plan for FY88 prepared	PS	+ 13
23.	Award of subprojects	PS	+ 14
24.	Selection of PSA & contract negotiation	PS	+ 15
25.	2nd amendment to Pro Ag for FY88 obligation	USAID/MPIC	+ 15
26.	1st Commodities Procurement Cycle initiated	PSA	+ 17
27.	Management Information System established	PS/SC	+ 17
28.	Continuous Grant Cycle in operation*	PS	+ 14 - 84
29.	3rd Steering Committee meeting	SC/PS	+ 17
30.	1st Internal Review & Report to AID	SC/PS	+ 18
31.	Two other information centers established	ENSTINET	+ 18
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<u>Action</u>	<u>Event</u>	<u>Responsible Party</u>	<u>Project Month</u>
32.	3rd Annual Operating Plan prepared	PS	+ 25
33.	USAID approves Operating Plan	USAID	+ 27
34.	3rd amendment to Pro Ag for FY89 obligation	USAID/MPIC	+ 39
35.	1st External Evaluation	USAID/PS	+ 43
36.	New Problem areas defined	PS	+ 44
37.	4th Annual Operating Plan	PS	+ 37
38.	Approval of New Problem areas	SC/USAID	+ 39
39.	RFP's on New problem areas issued	PS	+ 42
40.	Award on new problem areas	PS/SC	+ 46
41.	5th Annual Operating Plan Prepared	SC/PS	+ 49
42.	6th Annual Operating Plan Prepared	SC/PS	+ 61
43.	4th amendment for Pro Ag for FY92 obligation	USAID/SC	+ 63
44.	2nd External Evaluation	USAID/SC	+ 84
45.	PACD	USAID	+ 89

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Statutory Check List

5C(2) PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A. includes criteria applicable to all projects. Part B. applies to projects funded from specific sources only:
 B.1. applies to all projects funded with Development Assistance loans, and
 B.3. applies to projects funded from ESF.

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

A. GENERAL CRITERIA FOR PROJECT1. FY 1986 Continuing Resolution Sec. 524; FAA Sec. 634A.

Congressional notification will be submitted, in accordance with regular Agency practice.

Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the project.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$500,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

a) Yes

b) Yes

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

None required

4. FAA Sec. 611(H); FY 1986
Continuing Resolution Sec.
501. If for water or water-related land resource construction, has project met the principles, standards, and procedures established pursuant to the Water Resources Planning Act (42 U.S.C. 1962, et seq.)? (See AID Handbook 3 for new guidelines.) N/A
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project? N/
6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. No
7. FAA Sec. 601(a). Information and conclusions whether projects will encourage efforts of the country to:
(a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions. Some components of the project will serve to increase productivity in the industrial/commercial sector. These activities will directly affect (e) and indirectly affect (b)

8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

Most goods and many of the services financed under the Grant will be from private U.S. source.

9. FAA Sec. 612(b), 636(h); FY 1986 Continuing Resolution Sec. 507. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.

The Grant Agreement will specify the financial obligations of the Host Country including in-kind contributions.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?

The U.S. owns no excess local currency

11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?

Yes

12. FY 1986 Continuing Resolution Sec. 522. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?

N/A

- | | |
|---|-------------------------|
| <p>13. <u>FAA 118(c) and (d)</u>. Does the project comply with the environmental procedures set forth in AID Regulation 16. Does the project or program take into consideration the problem of the destruction of tropical forests?</p> | <p>Yes

N/A</p> |
| <p>14. <u>FAA 121(d)</u>. If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom)?</p> | <p>N/A</p> |
| <p>15. <u>FY 1986 Continuing Resolution Sec. 533</u>. Is disbursement of the assistance conditioned solely on the basis of the policies of any multilateral institution?</p> | <p>No</p> |
| <p>16. <u>ISDCA of 1985 Sec. 310</u>. For development assistance projects, how much of the funds will be available only for activities of economically and socially disadvantaged enterprises, historically black colleges and universities, and private and voluntary organizations which are controlled by individuals who are black Americans, Hispanic Americans, or Native Americans, or who are economically or socially disadvantaged (including women)?</p> | <p>N/A</p> |

3. Economic Support Fund Project
Criteria

- | | |
|---|--|
| a. <u>FAA Sec. 531(a)</u> . Will this assistance promote economic and political stability? To the maximum extent feasible, is this assistance consistent with the policy directions, purposes, and programs of part I of the FAA? | The project will promote economic and political stability by providing solutions to some of Egypt's major development constraints. |
| Yes | |
| b. <u>FAA Sec. 531(c)</u> . Will assistance under this chapter be used for military, or paramilitary activities? | No |
| c. <u>ISDCA of 1985 Sec. 207</u> . Will ESF funds be used to finance the construction of, or the operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified | No |

that such country is a party to the Treaty on the Non-Proliferation of Nuclear Weapons or the Treaty for the Prohibition of Nuclear Weapons in Latin America (the "Treaty of Tlatelolco"), cooperates fully with the IAEA, and pursues nonproliferation policies consistent with those of the United States?

- d. 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

5C(3) - STANDARD ITEM CHECKLIST

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

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

A. Procurement

- | | | |
|----|---|--|
| 1. | <u>FAA Sec. 602.</u> Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed? | Use of small businesses will be considered, in accordance with Agency policy and regulations |
| 2. | <u>FAA Sec. 604(a).</u> Will all procurement be from the U.S. except as otherwise determined by the President or under delegation from him?? | Yes, except for local cost purchases as authorized |
| 3. | <u>FAA Sec. 604(d).</u> If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company? | N/A |
| 4. | <u>FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a).</u> If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.) | N/A |

5.

FPA Sec. 604(o). Will construction or engineering services be procured from firms of countries which receive direct economic assistance under the FPA and which are otherwise eligible under Code 941, but which have attained a competitive capability in international markets in one of these areas? Do these countries permit United States firms to compete for construction or engineering services financed from assistance programs of these countries?

N/A

6.

FPA Sec. 603. Is the shipping excluded from compliance with requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent such vessels are available at fair and reasonable rates?

No

7.

FPA Sec. 621. If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? If the facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

Assistance will be provided by private enterprise and may include individuals from federal agencies. This will be determined after thorough Analysis of alternative sources in accordance with Agency and OMB regulations.

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8. International Air Transportation Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available? Yes

9. FY 1986 Continuing Resolution Sec. 504. If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States? Yes

B. Construction

1. FAA Sec. 601(d). If capital (e.g., construction) project, will U.S. engineering and professional services be used? N/A

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable? N/A

3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed \$100 million (except for productive enterprises in Egypt that were described in the CP)? N/A

C. Other Restrictions

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

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

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

4. Will arrangements preclude use of financing:
 - a. FAA Sec. 104(f); FY 1986 Continuing Resolution Sec. 526. (1) To pay for performance of abortions as a method of family planning or to motivate or coerce persons to practice abortions; (2) to pay for performance of involuntary sterilization as method of family planning, or to coerce or provide financial incentive to any person to undergo Yes

sterilization; (3) to pay for any biomedical research which relates, in whole or part, to methods or the performance of abortions or involuntary sterilizations as a means of family planning; (4) to lobby for abortion?

- b. FAA Sec. 488. To reimburse persons, in the form of cash payments, whose illicit drug crops are eradicated? Yes
- c. FAA Sec. 620(g). To compensate owners for expropriated nationalized property? Yes
- d. FAA Sec. 660. To provide training or advice or provide any financial support for police, prisons, or other law enforcement forces, except for narcotics programs? Yes
- e. FAA Sec. 662. For CIA activities? Yes
- f. FAA Sec. 636(i). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained? Yes

- g. FY 1986 Continuing Resolution, Sec. 503. Yes
 To pay pensions, annuities, retirement pay, or adjusted service compensation for military personnel?
- h. FY 1986 Continuing Resolution, Sec. 505. Yes
 To pay U.S. assessments, arrearages or dues?
- i. FY 1986 Continuing Resolution, Sec. 506. Yes
 To carry out provisions of FAA section 209(d) (Transfer of FAA funds to multilateral organizations for lending)?
- j. FY 1986 Continuing Resolution, Sec. 510. Yes
 To limit the export of nuclear equipment, fuel, or technology?
- k. FY 1986 Continuing Resolution, Sec. 511. Assistance will preclude use of financing for this purpose
 For the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights?
- l. FY 1986 Continuing Resolution, Sec. 516. Yes
 To be used for publicity or propaganda purposes within U.S. not authorized by Congress?

Annex P

Egypt: S&T for Development Project 263-0140: S&T Cooperation Component

Certification Pursuant to Section 611(e)
of the Foreign Assistance Act of 1961,
As Amended

I, Arthur M. Handly, the Principal Officer of the Agency for International Development in the Arab Republic of Egypt, do hereby certify that the technical assistance and training planned under the Science and Technology Cooperation Component of the Science and Technology for Development Project (263-0140) are sound. Further, I certify that the Government of Egypt has the human resources and financial capability to effectively utilize the assistance being funded.



Arthur M. Handly
Acting Mission Director

7/7/87

Date

Annex Q

Grantee Request for Assistance

(to be received after PP's approval)

FIRST AMENDMENT
TO
GRANT AGREEMENT
BETWEEN
THE ARAB REPUBLIC OF EGYPT
AND THE
UNITED STATES OF AMERICA
FOR THE
SCIENCE AND TECHNOLOGY
FOR DEVELOPMENT PROJECT

Clearances

LEG, KDTurner

EM, YAbdel Khalek

PPP/P, SAnderson

A-AD/HRDC, JSarn

A-OD/HRDC, EPeterson

Kof
for Sarn only *YKhalek*
28 Jan
[Signature]

Dated: 7/21/87

Drafted: KDT:mf:6/28/87:lsta140

First Amendment, dated to the Grant Agreement, dated March 31, 1986 between the Arab Republic of Egypt ("Grantee") and the United States of America, acting through the Agency for International Development ("A.I.D."), for Science and Technology for Development.

SECTION 1. The Grant Agreement is hereby amended as follows:

A. Section 3.1 is amended by deleting "Three Million United States ("U.S.") Dollars (\$ 3,000,000)" and by substituting "Eleven Million Forty Thousand United States ("U.S.") Dollars (\$ 11,040,000)" therefor.

B. Section 3.3(a) is amended by deleting "December 31, 1994" and substituting "December 31, 1995" therefor.

C. Article 4 is amended by adding a new Section 4.2A after Section 4.2 to read as follows:

"4.2A. Additional Disbursements for the Science and Technology Cooperation Component.

a. Prior to the disbursement of funds, or the issuance by A.I.D. of any commitment documents under this Agreement, to finance the three research programs (national, regional/local, and advanced technology), the Grantee shall, except as the Parties may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D.:

1. Evidence that all appropriate procedures necessary for governing the administration of project funds for the Science and Technology Cooperation (STC) Component have been formulated by the Grantee in consultation with A.I.D.;

2. Evidence that the Project Secretariat has formulated financial, contractual and procurement arrangements for the procurement of commodities and services for the STC Component; and any other documentation as A.I.D. may reasonably require.

~~b.~~ Prior to the disbursement of funds, or the issuance by A.I.D. of any commitment documents under this Agreement, to finance research, development and engineering subprojects for additional problem categories other than those specified in the Component Description in Annex 1A, the Grantee shall, except as the Parties may otherwise agree in writing, furnish to A.I.D, in form and substance satisfactory to A.I.D.:

1. Evidence that each such problem category meets the selection criteria set forth in the Component Description;

2. Evidence that a budget for such problem category, which includes, among other things, cost breakdown and disbursement projections over the life of each activity in the problem category, has been prepared; and any other documentation as A.I.D. may reasonably require.

D. Article 5 is amended by adding a new Section 5.4A after Section 5.4 to read as follows:

"SECTION 5.4A. Additional Covenants for SIC Component.

1. The Grantee shall provide, on a timely basis, all local logistic support as may be required to ensure effective use of goods and services financed by the Grant.

2. The Grantee shall ensure that the Steering Committee and the Project Secretariat meet formally with the A.I.D. project officer, at least semi-annually, to discuss major elements of progress in the STC Component.

3. The Grantee shall ensure that the research organizations, ministries, governorates and universities involved in the STC Component provide to the Project Secretariat and ESTINET all necessary scientific and technical information and technical and non-technical reports for the creation and computerization of appropriate data bases.

4. The Grantee shall make concerted efforts to integrate science and technology into the social and economic development plan of the GOE and to sustain and increase its integration into research, development and engineering activities undertaken by the Grantee.

5. The Grantee shall advise entities financed under the Grant to maintain such books and records relating to the Grant as may be prescribed in Implementation Letters. Such books and records shall be maintained and made available to both Parties or their authorized representatives for such periods and at such times as may reasonably be required, during three (3) years after the date of the last disbursement under the Grant.

6. The Grantee shall ensure that the Project Secretariat awards research subgrants on a competitive basis."

E. Section 8.2 is amended by deleting the words "the Minister of Higher Education and Scientific Research" and substituting the words "the Minister of Scientific Research" therefor.

F. Annex 1A entitled "Science and Technology Cooperation Component Description" is added after Annex 1 to read in the form of Attachment A hereto.

SECTION 2. Ratification. The Grantee will take all necessary action to complete all legal procedures necessary to ratification of this Amendment and will notify A.I.D. as promptly as possible of the fact of such ratification.

SECTION 3. Language of Amendment. This Amendment is prepared in both English and Arabic. In the event of ambiguity or conflict between the two versions, the English language version will control.

SECTION 4. Except as specifically amended or modified herein, the Grant Agreement shall remain in full force and effect in accordance with all of its terms.

SECTION 5. This Amendment shall enter into force when signed by both parties hereto.

IN WITNESS WHEREOF, the Arab Republic of Egypt and the United States of America, each acting through its respective duly authorized representatives, have caused this Amendment to be signed in their names and delivered as of the day and year first above written.

BY : _____

NAME : Kamal Ahmed El Ganzoury

TITLE: Deputy Prime Minister and
Minister of Planning and
International Cooperation

BY : _____

NAME : Frank G. Wisner

TITLE: American Ambassador

BY : _____

NAME : Ahmed Abdel Salam Zaki

TITLE: Administrator of the
Department for Economic
Cooperation with U.S.A.

BY : _____

NAME : Arthur M. Handly

TITLE: Acting Director, USAID/Egypt

Implementing Organization

In acknowledgement of the foregoing Agreement, a representative of the implementing organization has subscribed his name below:

MINISTRY OF STATE FOR SCIENTIFIC RESEARCH

BY : _____

NAME : Adel Abdel Hamid Ezz

TITLE: Minister of State for

Scientific Research

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Annex 1A

Science and Technology Cooperation Component Description
(AID Project No. 263-0140.01)

1. Project Purpose

The purpose of the Science and Technology Cooperation component (the "Project") is to redirect Egyptian S&T programs to solving priority development problems identified as having the greatest effect on end-users, and to build S&T capacities in selected technologies.

2. Project Description

To achieve its purpose, the Project will fund a competitive grant program for research in predefined high priority, problem categories. The research grants will be open to Egyptian universities, research centers, and private and public sector firms. This program will fund research, development, and engineering (RD&E) and is divided into three major subgrants.

- a. The National Research Program (NRP) subgrant will focus on solving limited, but well defined, national technological problems. Three specific problem categories were identified as having the highest priority. These are:

- Construction materials
- Industrial Mineral and Chemicals
- Soil improvement

Illustrative research projects under construction materials include: technical/engineering studies for brickmaking from locally available raw materials; and laboratory and pilot plant investigation of Egyptian raw materials and suitable additives.

Examples of research projects on industrial minerals and chemicals include studying the quality of ceramics and clay materials, developing of kaolin and aluminum refinement procedures, beneficiation and pilot studying of industrial minerals.

Soil improvement research includes development of simple technologies to be used by farmers to lower the water table, developing/adapting salt tolerant varieties of crops and new irrigation methods for use in areas with severe water shortages.

- b. The Local/Regional Research Program (LRP) subgrant will allocate funds for solving local/rural development problems identified by and associated with specific governorates or regions. Three problem categories were originally selected:

- Lake ecosystems
- Water and wastewater treatment
- Small scale industry

Illustrative research projects on lake ecosystems may include studying of the best economic use of Egyptian lake resources of Mariout, Borollos, Manzala, Bardawil, and Edku to slow pollution, increase fish catch and provide alternatives for dumping industrial wastes.

Water and wastewater projects may include training research staff in water treatment technologies, and application techniques for wastewater disposal as well as using drinking water from well supplies and using groundwater as a drinking source.

Small scale industry research will provide foreign market analysis, production and process design of small manufacturers, and studies for promoting entrepreneur prospects for Egyptian workers returning from abroad.

c. The Advanced Technology Programs (ATP) will be a national effort, highly selective and designed to build on advanced technology applications. Two applications have been selected:

- Biotechnology will be directed initially to techniques relevant to crops for semi-arid lands.
- Computer-Based Technology will be directed to process control for increasing industrial productivity.

Research projects may include using biotechnology and genetic engineering for increasing crop production such as beans (foul), dates, clover (berseem) and producing of non conventional animal feeds from agricultural and food processing wastes.

Computer based technology projects may include computer process control for improved electric power grid management, improved process controls for food processing and packaging and computerized produced management in textile processing.

3. Selection Criteria

In each of the above three subgrants, the problem categories include a number of potential research projects. These will be selected in a coordinated manner to develop a comprehensive solution to the specific problem category. Selecting these problem categories, as well as future problem categories to be identified during the course of the project, shall be based on the following criteria:

- Relevance to crucial Egyptian development needs within the Egyptian national economy.
- Consistency with AID's Development Assistance Program in Egypt in the areas of infrastructure, productivity, technology transfer, human resources, and private sector involvement.
- Full participation of the end-user groups (private/public sector enterprises, ministries, governorates) in defining and implementing the research projects and in the applying the research results.

- Demonstrated research and technical capabilities of scientists and engineers, and research-performed within a framework of interdisciplinary and interinstitutional cooperation.

4. Research Grant Awards

All research categories and research projects will be advertised in Egypt to enable Egyptian researchers to compete freely and openly. Research proposals will be submitted to an independent joint review board, in response to requests for proposals. Awards will be based on technical and cost merits and will take the form of a research contract between the end-user group/project secretariat and the researchers.

5. Dissemination of Information and Research Results

Several mechanisms are suggested to ensure that end-users and the S&T community maintain a dialogue and that practical priority problems are identified and addressed in this Project:

- The Project Steering Committee will commission specific studies to address specific research constraints and provide recommendations for possible problem category selection.
- The Project Steering Committee and USAID will cosponsor biannual meetings to discuss specific research problem categories and constraints impeding the use of science and technology in solving priority development problems.
- Research and end-user groups working in the same research categories will meet annually to discuss research problems and exchange views on the results of individual research projects.

6. Project Implementation

The following implementing agencies will be expected to conduct the research for end-user groups:

- a. The Egyptian universities through the foreign relations coordinating unit of the Supreme Council of Universities.
- b. The national research institutes belonging to the Egyptian ministries.
- c. Private and public sector organizations.

The project's management system will consist of a Steering Committee and a Project Secretariat. The Steering Committee and Project Secretariat will be created as a special unit at the Academy of Scientific Research and Technology which will be the coordinating agency for the Project.

A. Steering Committee

The Steering Committee will be chaired by the Minister of Scientific Research as Chairman and the President of the Academy of Scientific Research and Technology as Vice Chairman. Additional members are:

- Two governors.
- The Secretary General of the Supreme Council of Universities.
- The Chairman of the Federation of Egyptian Industries.
- The Director of the Development Research and Technological Planning Center of Cairo University (DRTPC).
- One representative of the Ministry of Agriculture who is serving under the National Agricultural Research Project.
- Three chairmen/directors of Egyptian private sector firms.
- One representative of the Department for International Cooperation with U.S.A.
- The Egyptian project Executive Director as an ex officio member.

The function of the Steering Committee is to establish policies and procedures for the project, approve new problem categories, review project and secretariat performance and approve grants and contracts above \$250,000 or its equivalent in Egyptian pounds. The AID Project Officer will be an ex officio member of the Steering Committee.

B. The Project Secretariat

The Project Secretariat will be the central point for managing and administering all project activities and operations. An Egyptian Executive Director, to be selected on a competitive basis, will be delegated full authority and responsibility for the daily technical, management and administrative activities of the STC project and secretariat.

The functional activities of the Secretariat include: executing the Steering Committee's approved policies and directives; recommending funding of research projects; awarding contracts/grants; monitoring and follow up on the research projects; maintaining project and financial records; conducting special studies; preparing annual budgets and work plan; liaison with the USAID Science and Technology office; and providing technical and administrative support services.

In order to support the Project Secretariat in its different technical functions, three additional services will be established:

- a. Technical Liaison Office
- b. Scientific and Technical Information (STI) services
- c. Procurement Services

a. Technical Liaison Office

This office will assist the Steering Committee and Project Secretariat in identifying research priorities, potential end-users of planned research and disseminating research results to interested governmental, private and public sector entities. The office will be composed of full time Egyptian technical liaison staff responsible for bridging the gap between researchers and end-users in the industrial and agricultural sectors and in the governorates. They will identify end-users, research possibilities and information already available in order to develop immediate applications of research products. The research findings should be consistent with the project's goals and objectives.

b. Scientific and Technical Information Services

The Project Secretariat will use the Egyptian National Scientific and Technical Information Network (ENSTINET) at the Academy of Scientific Research and Technology to perform the following functions:

- Establish information extension services for up to eight regional user centers or regional universities.
- Extend database searchers and document delivery services to regional universities.
- Establish indigenous S&T databases in each of the participating governorates or regional universities.

c. Procurement Services

AID will provide the services of a small business contractor and short term consultants to assist the Project Secretariat in its different organizational functions, (such as preparing requests for proposals, analysis of problem areas, participation in evaluating proposals, establishing technical liaison unit, etc.) as well as a management information system. A procurement service agent will purchase equipment for the research projects. Services of Egyptian project specialists will be retained to assist AID in monitoring this project.

7. Financial Plan:

Figure 1 summarizes the illustrative financial plan. Figure 2 provides an illustrative budget for AID contribution. Project financing involves an initial obligation of \$8.04 million in AID funds for this Project, and subsequent incremental obligations totalling an additional \$27.96 million for subsequent years. The project will help finance the foreign exchange and local currency costs of goods and services required for the project.

AID will fund grants, administrative and technical services for the project (including compensation for employees of the Project Secretariat in accordance with procedures to be mutually agreed upon between USAID and the implementing agency), commodities, local materials and supplies, training, information and documentation services as well as other technical and logistic services necessary to project implementation.

The GOE will cover the cost of local logistic support such as the basic salaries of the researchers and research support staff, normal operating and maintenance costs, overhead for Egyptian universities and research institutes, customs duty fees, procurement of local equipment, facilities and remodelling costs and local information services.

Commodity procurement includes equipment, materials, supplies, spare parts, accessories, computer hardware and software and field vehicles (excluding sedans).

In order to provide flexibility in project implementation, funds for research grants/services may be adjusted between line item categories by the Steering Committee for an amount not to exceed 15% of any individual line item.

Figure 1
 Illustrative Financial Plan
 AID Contribution
 \$(000)

	FY 87 Obligation			Future Obligation			Life of Project		
	FI	LC	Total	FI	LC	Total	FI	LC	Total
1. Grant Services									
- Research Contracts	315	2465	2780	1735	14225	15960	2050	16650	18700
- Egyptian Management	0	825	825	70	1585	1655	70	2410	2480
- Information Services	815	460	1275	635	440	1325	1700	990	2690
- Local Materials & Supplies	--	200	200	--	750	750	--	950	950
SUBTOTAL	1130	3950	5080	2440	17000	19690	3520	20950	21770
2. Participant Training	360	--	360	610	--	610	1170	--	1170
3. Commodities	1650	--	1650	6520	--	6520	8210	--	8210
4. Technical Supp. Services	620	90	710	715	225	940	1535	315	1850
GRAND TOTAL	4000	4040	8040	10725	17225	27960	14735	21265	36000

Illustrative Financial Plan
 Host Country Contribution
 LE(000)

	FY 87 Obligation				Future Obligation				Life of Project			
	GGE in kind	GCE in cash	Priv./Pub sectors	Total	GGE in kind	GCE in cash	Priv./Pub sectors	Total	GGE in kind	GCE in cash	Priv./Pub sectors	Total
1. Grant Services												
- Research Contracts	1600	--	100	1700	4700	--	650	5350	6300	--	750	7050
- Egyptian Management	55	50	--	105	145	30	--	175	200	80	--	280
- Information Services	120	100	--	220	350	250	--	600	500	350	--	850
- Renovation/facilities	400	150	--	550	1020	570	50	1640	1420	720	50	2190
SUBTOTAL	2175	300	100	2575	6245	650	700	7595	6420	1150	800	10370
2. Participant Training	25	--	--	25	115	--	--	115	140	--	--	140
3. Commodities	1000	200	--	1200	2540	650	--	3190	3540	650	--	4190
GRAND TOTAL	3200	500	100	3800	9000	1300	700	11000	12100	2000	800	15000

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Figure 2
Illustrative AID budget \$(000)

	FY 87 Obligation			Life of Project		
	FX	LC	Total	FX	LC	Total
1. Grant Services						
A. Research Contract						
- National Research Program	75	715	790	640	5900	6540
- Local Research Program	60	815	875	410	6090	6500
- Biotechnology Program	65	375	440	550	2350	2900
- Computer Based Technology	115	560	675	450	2350	2800
SUBTOTAL	315	2465	2780	2050	16690	18740
B. Egyptian Management Serv.						
- Project Secretarial 1/	-	675	675	70	2260	2330
- Equipment/Supplies	-	150	150	-	150	150
SUBTOTAL	0	825	825	70	2410	2480
C. Information Services						
- Technical Services	110	210	320	215	455	670
- Information database	530	250	780	1235	445	1730
- Equipment/Supplies	175	-	175	200	-	200
SUBTOTAL	815	460	1275	1700	900	2600
D. Local Materials/Supplies						
- National Research Program	-	100	100	-	460	460
- Local Research Program	-	50	50	-	195	195
- Biotechnology	-	15	15	-	130	130
- Computer Based Technology	-	35	35	-	165	165
- Renovation/facilities	-	-	-	-	-	-
SUBTOTAL	-	200	200	-	950	950
TOTAL Grant Services	1130	3950	5080	3320	20950	24770
2. Participant Training						
- National Research Program	30	-	30	200	-	200
- Local Research Program	40	-	40	200	-	200
- Biotechnology	130	-	130	400	-	400
- Computer Based Technology	90	-	90	250	-	250
- Management Services	20	-	20	20	-	20
- Information Services	50	-	50	100	-	100
TOTAL	360	-	360	1170	-	1170
3. Commodities 2/						
- National Research Program	310	-	310	3000	-	3000
- Local Research Program	260	-	260	1355	-	1355
- Biotechnology	400	-	400	2520	-	2520
- Computer Based Technology	720	-	720	1335	-	1335
TOTAL	1690	-	1690	6210	-	6210
4. Technical Support Services						
- Management system contr.	700	-	700	700	-	700
- Monitoring Support Serv.	120	90	210	277	223	500
- Evaluation/Audit	-	-	-	555	92	650
TOTAL	820	90	910	1535	315	1850
GRAND TOTAL	4000	4040	8040	14735	21265	36000

1/ Includes salaries, compensation, local travel & per diem, meetings, local services
 2/ Includes equipment, spare parts, shipping, insurance, fuel and other related costs

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Contributors to the Project Paper

1. Project Review Committee:

- HRDC/EDU:Adel Gohar
- IS/CI:Elaine Kelly
- DR/LAL:Graham Kerr
- AGE/A:Joseph Ecausoleil
- LLG:Karen Turner
- HRDC/CD/S&T:Lawrence J. Ervin
- HFPC/S&T:Sherif K. Arif (Chairman)
- PPP/PO:Sidncy Anderson
- DR/UAL:Tarek Selim
- FM/FC:Youssef Abdel Khalek

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- Mr. Clint Stone, Private Consultant
- Mr. James Blackledge, Private Consultant
- Dr. John Daly, NAS Coordinator, Office of Science Advisor, AID/W
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- Mr. Lawrence Ervin, Director, Office of Science and Technology, USAID/Cairo
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- Dr. S. El Hussein, Professor of Water and Wastewater Management
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- HRDC/S&T:Keena Shoukry
- HRDC/S&T:Salwa Wahba

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BUDGET - REGIONAL/LOCAL RESEARCH PROGRAMS
(\$'000)

<u>AREA/PROJECT</u>	<u>Project Year</u>							<u>Project Total</u>
	<u>FY87</u>	<u>FY88</u>	<u>FY89</u>	<u>FY90</u>	<u>FY91</u>	<u>FY92</u>	<u>FY 93</u>	
<u>Lake Ecology</u>								
Lake 1	24	226	202	22				474
Lake 2		70	235	213	25			551
Lake 3			24	244	224	26		518
Lake 4				25	253	235	27	513
<u>Small Industry</u>								
Furniture		25	100	50				175
Milk Process.			200	100	100			400
Cheese Mfg.				200	100	100		400
Project				25	100	50		175
Project					25	100	50	175
Project					25	100	50	175
<u>Water/Waste Water</u>								
Town 1		41	147	92	25			305
Town 2			41	147	92	25		305
Town 3				41	147	92	25	305
<u>New Areas</u>								
Project		200	100	100				400
Project			200	100	100			400
Project				250	200	200	150	800
Project					200	100	100	400
<u>Totals</u>	<u>24</u>	<u>570</u>	<u>1250</u>	<u>1610</u>	<u>1610</u>	<u>1020</u>	<u>402</u>	<u>6472</u>
<u>New Project Starts</u>	<u>1</u>	<u>4</u>	<u>4</u>	<u>5</u>	<u>3</u>	<u>0</u>	<u>0</u>	
<u>Projects in Progress</u>	<u>1</u>	<u>5</u>	<u>9</u>	<u>14</u>	<u>14</u>	<u>10</u>	<u>6</u>	
<u>Total Number of Projects</u>								<u>28</u>
					<u>Average Cost</u>			<u>300</u>

BUDGET - NATIONAL RESEARCH PROGRAMS

(K\$000)

<u>AREA/PROJECT</u>	<u>FY87</u>	<u>Project Year</u>					<u>FY92</u>	<u>FY 93</u>	<u>Project Total</u>
		<u>FY88</u>	<u>FY89</u>	<u>FY90</u>	<u>FY91</u>				
<u>Construction</u>									
Materials		185	237	159	82			663	
Project			250	200	200	150		800	
Project				250	200	200	150	800	
Project					200	100	100	400	
Project					200	100	100	400	
<u>Industrial Chem.</u>									
Chem Process			300	263	199	192		1033	
Project				200	100	100		400	
Project				250	200	200	150	800	
Project					200	100	100	400	
<u>Soils & Non Aras</u>									
Soil Analysis			1129	378	394	207		2108	
Project			200	100	100			400	
Project				550	250	250	200	1250	
Project				250	200	200	150	800	
Project					200	100	100	400	
=====									
<u>Totals</u>	0	185	2197	2600	2524	1790	550	10214	
<u>New Project Starts</u>	0	1	4	5	4	0	0		
<u>Projects in Progress</u>	0	1	5	10	13	11			
<u>Total Number of Projects</u>								15	
					<u>Average Cost</u>			537	

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