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APPLIED SCIENCE AND TECHNOLOGY RESEARCH IN EGYPT
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April - June 1983

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INTRODUCTION

This is the seventh quarterly report, Phase II, of the Applied Science and Technology Research Program in Egypt, covering the period April-June 1983. The program is under Contract NEB-0016-C-00-1058-00 of the United States Agency for International Development (AID) with the National Academy of Sciences/National Research Council (NAS/NRC).

For a background description of all elements of the Applied Science and Technology Research Program during Phase I (1978-1981), see the report prepared by the NAS/NRC staff dated June 1982.

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APPLIED SCIENCE AND TECHNOLOGY RESEARCH IN EGYPT

Seventh Quarterly Report: Phase II

April - June 1983

MAJOR ACTIVITIES

I. Policy Planning and Management

A. Joint Consultative Committee/S&T Policy Planning

The eleventh regular meeting of the Joint Consultative Committee (JCC) for the Applied Science and Technology Research Program was held May 9-11, 1983, at the headquarters of the National Academy of Sciences/National Research Council (NAS/NRC) in Washington, D.C., U.S.A.

The central focus of the meeting was one which could be described as that of "results orientation." The Program, according to Dr. I. Badran who is the President of the Egyptian Academy of Scientific Research and Technology (ASRT) and JCC Chairman, has had a successful inception period both in the laboratory and in field demonstrations. But the challenge before JCC is to catalyze a greater degree of application and diffusion of this experience toward adaptation-adoption in the villages and in industry.

One example of ASRT activity which has a "results orientation" promise for the longer term is the S&T Policy Measures Project. Reports were presented to JCC describing the two parallel efforts currently under development. First there is the "Policy Framework

Approach." Led by Dr. Esam Galal, this study utilizes a task force composed of representatives from the ASRT Councils and other recognized experts to examine policies which cut across (vertically integrate) many aspects of the economy. Examples are policy activities which deal with identification and selection of technologies (domestic or foreign) needed for economic development, the institutional framework and incentives designed to promote technology transfer and the encouragement of indigenous technology, and the legal instruments that encourage or discourage policy choices.

A second study, "the interactive approach," is guided by JCC member Dr. I. H. Abdel Rahman in his capacity as chairman of the ASRT Committee on Science and Technology Policy. Dr. Abdel Rahman has the collaboration of Dr. M. Shahat Awad as executive director for the study. Its approach is to gain the participation of the Ministry of Agriculture and particularly the Agricultural Research Centre, and of the Ministry of Industry through the General Organization for Industrialization, to examine the appropriate sections of the ASRT 5-year S&T research plans in relation to the goals of the National Economic and Social Development Plan. A series of well prepared meetings brings together the leadership elements of the Ministry research activities, the operational and executing officials, and the representatives of ASRT, NRC, and the leading university centers. By a process of analysis of the total program of R&D in the agricultural and industrial sectors (and later in the construction and energy sectors) a more comprehensive approach to a "technology policy" for Egypt can be achieved. With

the participation of the key organizations, institutions and individual experts an integrated policy statement with a broadly based action plan should be possible.

As a further input into S&T policy studies, a series of study and orientation visits to Boston, New York and Washington were made in May 1983 by Drs. Essam Galal and Mahmond Mahfouz of the technology policy group. They were joined by Drs. Hassan Ismail and Abdul Aziz Hegazi, Egyptian JCC panelists. Their schedule included policy discussions and seminars with the following:

- Center for Policy Alternatives, MIT (Dr. Nicholas Ashford, Director)
- Technology Adaptation Program, MIT (Dr. Fred Moavenzadeh, Director)
- John F. Kennedy School of Government (Dr. Harvey Brooks, NAS member and Professor of Technology and Public Policy)
- Howard Johnson, Chairman of the Corporation, MIT
- Center for Science and Technology Policy, New York University (Dr. Herbert Fusfeld, Director)
- Program on Policy Studies in Science and Technology, George Washington University (Mr. Herman Pollack)
- Office of Technology Assessment, U.S. Congress (Dr. John Gibbons, Director)
- Science Resources Studies, National Science Foundation (Dr. Charles Falk, Division Director)
- Office of Science and Technology Policy, Executive Office of the President (Dr. Nancy Maynard, Policy Analyst)

Both the "policy framework" approach and the "interactive approach" studies are to be completed by October 1983 for discussion and revision during the third national S&T policy workshop under ASRT sponsorship to be held November 6-7, 1983 in Cairo. Presentation of conclusions will then take place and further discussions occur during the third international S&T policy seminar of the Applied Science and Technology Research Program, November 16-17, 1983, also in Cairo. The JCC participates in the international seminars and assists the ASRT in the conceptualization of the policy framework. The goal of this long process of analysis, consensus building and debate is the formulation and exposition of S&T policy guidelines supporting the Egyptian National Development Plan.

A second ASRT activity which is "results oriented" is the 5-Year S&T Plan. In August 1981 the Egyptian Ministry of Planning issued the Egyptian National Development Plan: 1982-1987 with eight major categories (volumes) under the titles:

- The Egyptian people (general background and statistics)
- General strategy for agriculture, irrigation and food security.
- General strategy for industry and mining.
- General strategy for energy.
- General strategy for housing, urbanization, public health and services.
- General strategy for transportation and communication.
- General strategy for commerce and finance, and
- General strategy for regional development.

In 1981 utilizing each of its Specialized Councils, the ASRT developed a document, the 5-Year S&T Plan, proposing funding for 286 specific new R&D projects, 111 continuing projects and a series of seminars (See Figure 1), all in support of the Egyptian National Development Plan.

Figure 1 (A)

The 5-Year Science & Technology Plan
of the
Egyptian Academy of Scientific Research and Technology

R&D Area	Number of New Projects Proposed	Budget LE x 1,000	Number of On-going Projects Proposed	Budget LE x 1,000
1. Resources and Production				
o Food/Agr.	45	12.9	27	*
o Industry	20	1.5	10	*
o Energy/Petroleum & Minerals	30	5.2	13	*
Subtotal	<u>95</u>	<u>19.6</u>	<u>50</u>	<u>7.8</u>
2. Services				
o Health/Medicine	38	2.5	20	*
o Environment	17	9.9	5	*
Subtotal	<u>55</u>	<u>12.4</u>	<u>25</u>	<u>1.3</u>
3. Infrastructure				
o Transportation & Communication	27	2.1	5	*
o Construction & Housing	35	6.8	7	*
o New Settlements	14	2.2	*	*
Subtotal	<u>76</u>	<u>11.1</u>	<u>12</u>	<u>1.1</u>
4. Economics and Social Development				
o Mgt & Economics	37	0.3	4	*
o Population & Sociology	*	1.9	5	*
Subtotal	<u>37</u>	<u>2.2</u>	<u>9</u>	<u>0.1</u>
5. Basic Sciences	23	1.6	15	0.7
6. Seminars & Meetings	*	5.1		
GRAND TOTALS	286	52.1	111	11.0

* Not available.

(A) Source: El Nockrashy, A.S. "The Five Year Science and Technology Plan:
A Proposed Operational System." ASRT, Cairo, January 1983, pp. 15-17.

Thirdly, the JCC was apprised of two medium-term planning activities of the ASRT which are "results oriented."

1. Land Reclamation Studies

The ASRT together with the Ministry of Land Reclamation has undertaken a review of land resettlement experience in Egypt over the period since independence. In the process of evaluating the successes and failures a variety of methodologies have been used. Since the 1982-87 National Development Plan puts heavy reliance upon reclamation of marginal lands and substantial resettlement in these areas, it is important to understand the causes for past success and failure. Thus, a summary statement which takes full account of previous evaluation efforts and utilizes an agreed upon methodology can provide guidelines for planning, design, and implementation of new reclamation projects.

2. Regional Centres

R&D in Egypt has been directed primarily from institutions and centers located in Cairo or Alexandria. As development of the country is decentralized and the responsibility given to the Governorates for planning/implementation, there is the need for regional institutions to conduct resource surveys, to mobilize multidisciplinary teams of scientists and end-users, and to analyze results prior to local implementation and adaptation. Regional centres should take on specializations characteristic of the problems and opportunities wherein they are located. As an example, textiles research might reasonably be undertaken in the Delta, sugar industry R&D in El Menia Governorate of Upper Egypt

where sugar cane is principally grown, and fisheries research at the Suez and Red Sea Governorates.

The ASRT and the National Research Centre (NRC/Cairo) are studying the possible establishment of a center on rural development at Mariut in the Western Delta area. Here the experience of More and Better Food and the Biogas demonstration projects, as well as NRC/Cairo experience with Giza, Menoufia, Fayoum and other Governorates could be specifically adapted for new settlements where water quality is poor, or where water for irrigation purposes is far more restricted than in traditional Egyptian agriculture.

A summary of the Eleventh Meeting, Joint Consultative Committee, Applied Science and Technology Research Program, held at the NAS/NRC in Washington is included with this quarterly report (See Attachment 1)

B. R&D Management Training

In an effort to broaden the base for selection of organizations and individuals in the United States that would be called upon to assist the ASRT in R&D management training, the NAS/NRC issued a "call for proposals" in June 1983. The objective was to select an organization (or consulting firm) that would collaborate with ASRT in a 5-day R&D management seminar for approximately 30 experienced project/program managers from industrial, agricultural and health-related applied research institutions. The "Program Management Seminar" was originally scheduled at the National Research Centre in Cairo for early September 1983 but now is to be

held early in 1984. A copy of the "call for letter proposals" and the suggested content for the "Program Management Seminar" are given in Attachment 2 of this quarterly report.

Organizations/individual firms that were solicited are:

1. Research Institutes

- Battelle/Columbus Laboratory (Columbus, Ohio)
- Denver Research Institute (Denver, Colorado)
- Midwest Research Institute (Kansas City, Missouri)
- Research Triangle Institute (Research Triangle, North Carolina)
- Southwest Research Institute (San Antonio, Texas)
- SRI International (Stanford, California)

2. Universities

- George Washington University (Washington, D.C.)
- Georgetown University (Washington, D.C.)
- Northwestern University (Evanston, Illinois)
- Polytechnic Institute of New York (New York)

3. Consulting Organizations

- Arthur D. Little, Inc. (Cambridge, Massachusetts)
- Applied Research and Development Associates (Atlanta, Georgia)
- Developing World Industry and Technology, Inc. (Washington, D.C.)
- International Science and Technology, Inc. (Washington, D.C.)
- Gilbert B. Devey, Technology Consultant (Washington, D.C.)

Responses were received from Battelle/Columbus, Denver Research Institute, George Washington University, Georgetown University (International Law Institute) and International Science and Technology, Inc. Evaluation and ranking of the five responses was conducted at the ASRT, NRC/Cairo and by NAS/NRC. On the basis of (a) relevance to Egyptian needs, (b) qualifications of the proposed trainers, (c) previous experience of the firm in Egypt, and (d) usefulness of the proposed program in relation to "institutionalization" of the management training function within Egypt, the Denver Research Institute (DRI) proposal was ranked above the others received. NAS/NRC and ASRT are collaborating with DRI in the implementing of the training activity with the period September 3-7, 1983, as the preferred time for the Program Management Seminar. (Note: Postponed until 1984 at the request of ASRT.)

II. Demonstration/R&D Projects

A. More and Better Food

In conjunction with travel to the United States for JCC-XI, Drs. A. S. El Nockrashy and Osman Galal met with Dr. Gilbert White (U.S. Panel, JCC) and with Dr. James Fitch, an agricultural economist who has had extensive Egyptian experience working in farm systems and integrated rural development, to explore mechanisms for extension and diffusion of results in the More and Better Food Project. Dr. Fitch will be in the Sudan in July and has been invited to meet with the Steering Committee as well as visit the demonstration villages.

Dr. C. O. Chichester (Executive Director of the Consortium for the Development of Technology and Vice President of the Nutrition Foundation) visited NRC/Cairo for discussions concerning the proposed food technology pilot plant. The ASRT has granted from its FY 1983 budget one half the funds needed for the food technology building. Permission to grant the remainder of the funds from the FY 1984 budget (beginning July 1983) awaits a decision in the Planning Office of the Prime Minister.

B. Biogas Technology for Rural Areas

Drs. Harold Capener (Dept. of Rural Sociology, Cornell University) and Philip Goodrich (Dept. of Agricultural Engineering, University of Minnesota) who serve on the U.S.-Egyptian panel for the biogas demonstration project visited Egypt in conjunction with field studies on social acceptability of biogas technology. Dr. Capener accompanied an NRC/Cairo team to film (video-tape) a typical farm situation (village in the Delta) where an individual biogas digester has been constructed based upon wastes from the farm animals. The film is able to show an improved waste management system whereby the family benefits from availability of a gas supply, an improved and more hygienic source for natural fertilizer (digester sludge), and improved hygienic conditions in the animal sheds adjacent to family living quarters.

Several factors, however, inhibit more rapid diffusion of individual biodigesters in Egyptian villages. Chief among these is the initial investment of LE 500-700 (U.S. \$600-850). Other deterrents are the highly subsidized price for buta-gas (bottled

gas sold by the Egyptian government); availability of land for construction of the bio-digester; and the lack of a developed system to construct biogas digesters and train persons in their operation and maintenance. The NRC/Cairo does not see its role to be the implementing agency for diffusion of biogas technology throughout Egypt. The Centre, however, has offered to train a cadre of engineers and extension agents for ORDEV to carry the technology to the villages and to serve as the scientific-technical backstopping agency.

NRC/Cairo personnel who are members of the biogas group came to the U.S. for training, orientation and study on instrumental methods of analysis related to biogas technology and on fertilizer utilization and efficiency (See Attachment I, page 3)

In conjunction with participation in Bangkok, Thailand, on biomethanation systems, Dr. M. A. Hamad visited groups active in biogas system development in Korea, India and the Peoples Republic of China.

C. Arid Lands/Land Reclamation Demonstration Project

Reported under the section concerning JCC-XI, Page 6 and in Annex A, Attachment 1 of this report.

D. Preparation of Selected Pharmaceutical Chemicals - R&D Project

Dr. M. B. Fayez, ASRT Vice President and project director, spent two weeks in the United States in April to confer with leaders in the pharmaceutical industry about the project. His principal areas of interest were:

- Chemical engineering systems in pharmaceuticals preparation (Scale-up from laboratory to pilot plant and from pilot plant to full-scale production)
- Quality control, product yield, and productivity
- Economics of production for specific chemical pathways; base price of chemical intermediates.

The principal persons with whom Dr. Fayez conferred were:

(a) Dr. Lewis Sarett, Senior Vice President (retired), Merck & Company, and NAS member; (b) Dr. John Hubbard, President, Upjohn Company and IOM member; and (c) Dr. Robert J. Gerraughty, Vice President, Creighton University (Omaha) and IOM panel member for the 1979 study of pharmaceuticals development in Egypt.

A principal outcome of the visit was agreement by Upjohn, Merck, and Ciba Geigy pharmaceutical producers to receive four Egyptian participants from the group of Dr. Fayez for very specialized in-plant orientation and study on manufacturing methods (scale-up), quality control, R&D organization and management, and market planning strategies. The orientation/study tours are scheduled for the month of August 1983.

E. Corrosion in Petroleum Refining - R&D Project

Dr. Abdel G. El-Hosary, co-principal investigator for the NRC/Cairo corrosion project, visited the United States to present a paper at the International Conference on Corrosion Inhibition in Dallas, Texas, in May. He also visited corrosion R&D facilities at Lehigh and Ohio State Universities, the industrial corrosion

consulting firm of Unichem, International (Hobbs, New Mexico) and the Amoco Research Center (Naperville, Illinois). While in the U.S.A., Dr. El Hosary conferred with all three persons who have served on the advisory panel for the corrosion R&D project. (Drs. Henry Leidheiser at Lehigh, Earl Snavelly at Mobil R&D Laboratories and Joerg Gutzeit at Amoco Research Center.)

F. Bentonite Clays for Industrial Applications - R&D Project

In April Mr. Donald J. Weintritt, a consulting engineer from Lafayette, Louisiana, went to Cairo to work with the bentonite R&D group principally on alkali activation of materials from the Fayoum deposits. The goal was to review technical and economic feasibility of utilizing the Fayoum bentonites as foundry sand binders and as drilling fluids, thereby providing a basis to substitute Egyptian bentonite clays for imported materials.

Mr. Weintritt found that the technical case for high quality activation of the Fayoum bentonites still needs to be proved. In particular, measurements of cation exchange capacity and of soluble salt content of the beneficiated Fayoum materials are required. Because of the gypsum content of wet-processed Fayoum bentonites, those materials may never be cost competitive with high grade materials presently available from the United States and elsewhere for drilling fluids and foundry sand binders. There are, however, other naturally occurring bentonite clays in Egypt which have not been sufficiently tested and which may hold greater promise for industrial applications than those from the Fayoum.

G. Phosphate Fertilizers/Wool Scouring/Red Sea Fisheries - R&D
Projects

For the three projects, reports were prepared for the JCC and are available either from ASRT or NAS/NRC. The phosphate project awaits delivery of key items of equipment for the bench scale wet processing unit; the wool scouring line is being tested at the Misr Beida Dyers plant; and field data are being collected from the Red Sea area.

DISCUSSION

The discussion section of this quarterly report is concerned with some of the lessons learned in management of elements in the Applied Science and Technology Research Program. The intent is not to suggest that there are clear, straightforward solutions to all management problems encountered. The goal of this section is much more modest--to describe situations where improvement can be expected to occur in the future. Often the management systems for both the American and the Egyptian partners need refinement and closer coordination in order to achieve better results.

That the two countries have institutional and operational differences in administration and management of research and development (the "bureaucracy" of R&D) was a factor well known to both when the program of cooperation began in 1978. Indeed, one of the goals of the partnership is to seek accommodations in the management of the two systems while testing new approaches in Egypt that might increase the application of S&T to economic and social development problems. The goal of R&D management change was to be undertaken

modestly and limited to "experiments" within the Academy of Scientific Research and Technology and the National Research Centre.

The following are some examples of as yet unsolved management situations (problems) which illustrate the need for continuing work in an atmosphere of good will among the parties involved.

Example No. 1: The S&T Policy Measures Project

The fundamental objective of the S&T Policy Measures Project is to link Egyptian institutions in ways to produce new mechanisms and strategies that optimize the use of Egypt's S&T resources in the process of national development. The Steering Committee for the project is the JCC members themselves--they comprise a "board of directors" for the work. There is acknowledgement by the JCC that information on Egyptian manpower and institutional resources and the legal structure for policy formation and program achievement need to be gathered on a consistent basis and analyzed. From this process options for future strategies linking science and technology to the Egyptian 5-Year National Development Plan presumably may be postulated. It is then the responsibility of management in the ASRT and elsewhere in the GOE to assess the options in light of the political, social and economic situation and to initiate a clearly defined program of action.

To arrive at the options for S&T strategies in Egypt there has been a three year program of discussions involving appropriate persons from the ASRT and its Advisory Councils, from the research institutes affiliated to the ASRT, from universities, from R&D institutes of Ministries, from public sector industries and from other sectors of the economy. Efforts have been made to include representation from the

Peoples Assembly and the Shura Council (Legislative Branch of the government). It was deemed appropriate to conduct the consensus building discussions along two parallel paths--one across common elements of organization (the vertical or integrative approach) and another across functional (the horizontal or inter-active approach). National meetings were held in 1981 and 1982 to seek a consensus on the study content. Beginning in 1983 task force groups were formed, generally of wide scope and membership, to focus more specifically upon those areas of consensus and to distill options for examination during a third national meeting. Although chairmen have been designated for the two approaches to S&T policy formation, they have not had full-time staff assigned specifically to assist with the identification of issues and exposition of policy options. Commissioned papers have not been produced for review and comment by persons within and outside the two task force groups. Also no non-Egyptian inputs have been factored into the process on a systematic basis. The opportunity for early cross linkage and a sharpening of focus is not immediately evident to those outside the process. The entire project has been within the context of the Applied Science and Technology Research project and financially supported by it, but interaction with the wider group of JCC members was not achieved. Furthermore, an opportunity for in-depth analysis by international experts from such organizations as UNESCO and UNIDO, or from the American partners has not occurred. The impression, therefore, is one of a verbal, somewhat amorphous, consensus building process without planned elements of policy analysis and structural rigor. The original goal was to use the three year period to achieve a

series of actions leading toward a more clearly enunciated technology policy for Egypt. Implicit in this was the production of a series of base-line studies--well researched, documented and containing policy options rather than a single policy statement. This goal does not appear on the horizon for 1983; the "train" for policy making is on the track but the "station" is not in sight. Thus the system to achieve the S&T Policy measures end product, in the spirit of the partnership of the Applied Science and Technology Research Program merits further JCC examination and discussion.

Example No. 2: Procurement Complexity

In the phosphate ore evaluation/conversion project there are two steps which are essential to achieve success. One is the physical separation of impurities from the large mass of ore as received from the mine. This process of ore beneficiation is extremely important to achieve good economic recovery. The laboratories at the National Research Centre and the pilot plant facilities of the Central Metallurgical Research and Development Institute were well equipped for this aspect of the work. The technical reports amply document the results.

A second step involves chemical conversion of beneficiated phosphate ore to phosphate end products. Neither standardized bench-scale, wet process conversion equipment nor pilot-plant equipment is available. A bench scale conversion unit exists at the International Fertilizer Development Center (Muscle Shoals, Alabama) that was designed, built and tested in their laboratories. Since there is such a limited market for such equipment, there are no equipment and

instrumentation suppliers that offer a standard unit "off-the-shelf." Thus two engineers from the Egyptian phosphate group in the course of their training at the IFDC became familiar with the design and operation of the wet process conversion equipment. They drew up specifications for an enhanced wet-processing unit under the equipment procurement guidelines of the Applied Science and Technology Research program.

A natural aspect of procurement for the project equipment is one of competitive bidding. The procurement specifications for the elements of the wet process unit were tightly drawn, but in the process of bidding alternative designs were suggested by bidders. Since the procurement contractor was neither a specialist in chemical processing nor in technical procurement (instrumentation, laboratory equipment, etc.) much time was lost in constant referral back to a group that could provide guidance. Some items also required custom fabrication and still others were unavailable. Thus substitutes had to be sought, bid and purchased.

This process has required over 30 months of follow-up and still the wet process unit is not assembled and operational in Cairo.

Lessons learned from this experience are:

1. The design specifications for custom-made units must be rigidly detailed.
2. A procedure for central procurement/shipment responsibility must be given for the system rather than the component parts.
3. The responsibility must be in the hands of a competent technical organization able to assess adequacy of "substitutions" when proposed.

4. Consideration should be given to a U.S. "holding place" to gather all components for single (or at least) well coordinated shipments to Egypt in logical units.

5. The technical procurement contractor and the receiving laboratory in Egypt should work together in the assembly, testing and final acceptance of the custom built equipment.

The most important lesson from this experience is one that can be applied to the proposed food technology pilot plant. Although much of the equipment as individual pieces can be purchased "off-the-shelf" it is essential that a contractor on the U.S. side be given responsibility for the entire procurement task. Planning, coordination of purchases, checking and re-checking of specifications, and coordination of equipment shipment to NRC/Cairo are essential. Furthermore, training on the equipment is an essential activity and the technical procurement contractor might also serve in that capacity. Thus for the food technology pilot plant the need is to secure a service for an integrated, complex system so that time and funds are best utilized.

Example No. 3: Local Supplies and Materials

During Phase I the AID Mission in Cairo agreed to a change in the guidelines for the Egyptian Pound fund which was provided directly to the ASRT. That fund was originally intended to provide modest incentive payments and, as amended, also permitted the purchase of local supplies and materials to support those projects. During Phase II a large (LE1.2 million) fund for local supplies and materials was made available for the program under specific, highly structured conditions. Regulations were outlined and included the following:

- Local Materials and Supplies (LMS) are defined as raw materials available in stock on the Egyptian market. Machinery, imported scientific equipment available in Egypt, office machines and vehicles are excluded.
- Procurement of commodities under LE 10,000 is governed by rules of competitive bidding but does not require specific prior authorization from the AID technical office.
- The LMS fund was specifically structured. Each demonstration project and each R&D project required an approved budget and implementation plan; only then was it given a first quarter allocation. Replenishment of the working funds was to be based upon actual expenditures.
- Special rules governed service and wage subcontracts so that the AID general prohibition on incentive payments from Phase II funds would be maintained. (ASRT had a separate incentive account from GOE sources.)
- Travel and per diem payments for in-Egypt field activities were not authorized from the LMS fund.

The LMS fund proved to be unwieldy because the guidelines seemed too restrictive and project managers did not find operational flexibility that they felt was required. Examples of that lack of flexibility were:

- The pharmaceuticals R&D project was unable to pay necessary fees for in-house analytical services from the NRC central services laboratory. Service fees are a customary charge within the Centre to replace expendible supplies used in the analyses, to provide for

maintenance and repair of equipment, and to amortize the cost of the instrumentation so that replacements can be made on a timely basis.

- Field activities require attention in many situations where trips out from Cairo and return the same day are not practical. Funding for the purpose of lodging and other necessary expenses was not provided from the GOE incentive fund or from the LMS fund.

- The LMS funds were not available to reimburse service and wage contracts of GOE auxiliary personnel (such as drivers of vehicles) for field visits or additional GOE personnel assigned to maintain bookkeeping, reporting and similar functions.

As of the end of June 1983 no fully operational plan to alleviate the shortcomings was at hand.

TRAINING/ORIENTATION/STUDY

STATISTICS

April - June 1983

I. Travel from Egypt to USA for JCC

- JCC Members 5
- Advisors to JCC 5
- Other 1
- NAS/NRC Resident Program Director 1
(for JCC/consultation)

II. Travel from Egypt to USA for Project Purposes

- S&T Policy Measures 4
(in conjunction with JCC)
- More and Better Food 2
(in conjunction with JCC)
- R&D Management 1
- Biogas Technology 3
- Corrosion 1
- Pharmaceuticals 1

III. Travel from USA to Egypt

- Program Planning & Management 1
- Bentonites 1
- Biogas Technology 2

Details on the training, orientation and study visits are given in Attachment III.

Attachment I

ELEVENTH MEETING
JOINT CONSULTATIVE COMMITTEE
APPLIED SCIENCE AND TECHNOLOGY RESEARCH PROGRAM

Washington, D.C., U.S.A.
May 9-11, 1983

Report prepared by:
Academy of Scientific Research and Technology
Cairo, Arab Republic Egypt

Board on Science and Technology for International Development
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Eleventh Meeting, Joint Consultative Committee
Applied Science and Technology Research Program

Egyptian Academy of Scientific Research and Technology
U.S. National Academy of Sciences/National Research Council

Washington, D.C., U.S.A.

May 9-11, 1983

DRAFT RECOMMENDATIONS AND CONCLUSIONS

I. Introduction

The eleventh regular meeting of the Joint Consultative Committee (JCC) for the Applied Science and Technology Research Program was held May 9-11, 1983, at the headquarters of the National Academy of Sciences/National Research Council (NAS/NRC) in Washington, D.C., U.S.A.

Dr. Gilbert White, Chairman of the U.S. JCC panel welcomed all the members on behalf of the NAS/NRC and thereafter presented Dr. Ibrahim Badran, JCC Chairman, who gave the charge to the group. Dr. Badran's remarks highlighted the following:

- The Applied Science and Technology Research Program, active for six years has broadened and deepened relations among the scientists and institutions involved in each country.

- Progress in most of the individual projects has been notable. In those where there is a certain lag in anticipated achievement corrective actions are being taken.

- Projects have moved from the laboratory to the pilot plant and field demonstration phase. This is as it should be; application to real life situations is the goal and will be the ultimate measure of achievement

- The international cooperation has involved the mixing of Egyptian and U.S. management systems. With good will on both sides problems can be solved.

- There is criticism arising in Egypt over the character, pace, and progress of some of the programs of scientific cooperation. Certainly the time has come to face these situations and give a "new push" to specific projects and their implementation in industry and agriculture.

- There is a continuing need for institutionalization of the work. In this context "institutionalization" implies adaptation to Egyptian realities increasing Egyptian management responsibility and Egyptian control.

II. General Conclusions

A. Recognition of the National Research Centre outreach

The JCC members expressed appreciation of, and offered congratulations to the National Research Centre for the results of its outreach efforts with the Governorates, villages, and industries in the conduct of the Applied Science and Technology Research Program.

B. Recognition of the Work of Mr. James Riley

Mr. James Riley, Director of the Science and Technology Division for the U.S. AID Mission in Cairo, will return to the United States during the summer of 1983 after more than six years in Egypt. Dr. Badran asked that the record show that Mr. Riley has been a friend of the Applied Science and Technology Research Program in Egypt and an honest representative of his government.

He will be missed, but the JCC members thank him for his friendship and his efforts on behalf of the program.

The words and feelings of Dr. Badran were endorsed by all.

III. The Five-Year Plan for Science and Technology in Egypt

The Five-Year Plan for Science and Technology in Egypt (1983-1987), prepared by the Specialized Councils of the Academy of Scientific Research and Technology (ASRT) to assist in the development of the Egyptian economy was presented to the JCC members. The Plan is now an essentially completed task.

The next phase is the implementation of the program outlined in the Plan. That task presents a major management challenge and the time available is extremely short. Given the magnitude of the task, and the shortness of time professional resources available, both technical and managerial, should be strengthened, coordinated and consolidated.

The question before the JCC members was how the American scientific, technical and management community could assist in the implementation phase.

The Five-Year Plan concludes with a list of research projects. The next step in the implementation of that R&D program is obviously the development of very specific and detailed plans for the execution and management of each project or group of related projects.

The detailed plan for each project should be equivalent to a PERT chart that would include management, evaluation, scheduling, etc.

Among the more important factors are:

- Project management plan
- Manpower assignments and development
- Work schedule
- Financial plan
- Marketing plan
- Evaluation and revision
- Management information systems

Certain of these factors need some clarification.

1. Evaluation and Revision

There must be a mechanism to enable the projects and/or program to be revised when conditions require changes:

Selection:

a) From the beginning of the program it is necessary to evaluate continuously whether each project addresses real issues for the sector to which it is directed.

b) Since the entire program cannot be implemented immediately, it is desirable that the initial selection include projects which have high priority and great probability of success in the shortest time.

Adjustments:

The interim results of the technical work will often indicate the need for a change in direction. The methodology for making such changes must be developed.

Budget changes:

Contingency plans must be in place with evaluation procedures so that budget changes can be handled on an orderly basis which the staffs and the ministries involved will consider to be equitable..

2. Marketing Plan

There is a continuing need to ensure that the results of the individual research projects will be utilized by the appropriate end-users. A systematic interchange of information at the technical, economic and management levels must be planned from the outset of the activity.

3. Manpower Assignment and Development

In the immediate starting phase, professional workers will have to be assigned as available. However the five-year plan will require the development of managers, both general managers and specialists for R&D management with emphasis on the professional and pragmatic aspects of management.

4. Management Information System

The Management of the projects will require accumulation of base line data and continuing data flows for the purpose of evaluation and control. Such a capability should be in place from the beginning of the program.

As a parallel activity the continuation of the R&D Management Project and its financial resources should be utilized for the

implementation of the Five-Year Plan with particular emphasis on:

- Project Management
- Evaluation and Revision
- Marketing
- Manpower Assignment and Development
- Management Information System

The JCC members strongly support the participation of the American S&T community in assisting this program. The ASRT will forward its suggestions within 6 weeks concerning the kinds of assistance which are most appropriate. A target date for a mutual understanding is set for August 1, 1983; the launching date for the Five-Year Plan.

The JCC has also agreed to identify specific projects within the Five-Year Plan that can be extended or strengthened through American assistance and support. The following time table is agreed upon:

- Identification of projects and a design and budget for extension or strengthening will be provided by the ASRT within three months.
- The American JCC members will provide programmed and coordinated proposals to define its proposed contributions to project extension or strengthening by the November 1983 meeting of the JCC.

IV. Science and Technology Information Project

The JCC expressed its appreciation for the massive effort that was carried by the Egyptian team in preparing a detailed system design for the STI network.

The policy level activities and tasks, the responsibility for which has been assumed by the ASRT, require technical consultancy assistance over the three year period of the project from the Georgia Institute of Technology for a total estimated cost of LE 750,000. This sum includes the estimates for policy level committee operations and incentives for the staff members in the five nodes. The project (263-0016) contractual agreement calls for a budget of LE 265,000 as the Government of Egypt contribution. The balance of the funds (LE 485,000) should be committed from another source so that the operation of the nodes can begin.

The interaction of the STI project with other information intensive projects such as agriculture, mineral resources, energy, etc. requires integration. Therefore, it is suggested that within the U.S. AID Mission in Cairo there should be a mechanism to assure an integration of information components of different projects with a Scientific Information System. It is further recommended that this mechanism be adopted by the Egyptian counterpart organization.

V. Instrumentation systems (University of Wisconsin/Madison Procurement.

Several instances have occurred wherein subproject funding limitations are providing constraints on equipment procurement. (Examples are the phosphate ore R&D project and several NBS projects.) The JCC recommends reallocation of funds from projects which at the mid-point of the UW/ISC program, are not fully utilized and reassignment of those funds to those which have additional requirements to complete project goals.

Some problems and misunderstandings regarding delivery times have occurred because of the lack of awareness of purchasing procedures by some of the participants. The competitive bidding process requires time and manufacturers have control over delivery schedules. In general the elapsed time between the receipt by UW/ISC of an USAID/Cairo approved procurement list and equipment delivery ranges between 100 and 500 days. Because of this, June 1983 has been established as a cut-off date for receiving new equipment lists at UW/ISC. Although every effort will be made to procure equipment, delivery prior to the termination of the UW/ISC contract and its concomitant logistics management sub-contract cannot be assured if the approved procurement lists are received after the June 1983 date.

The procurement effort is proving to be more labor intensive than provided in the contract; therefore, budgetary problems may occur in the latter half of the effort which will require reallocation of funds among contract components.

VI. Institutionalization of Maintenance and Repair Capabilities (NIH)

Before the termination of the Applied Science and Technology Research Project, the JCC recommends that the UW/ISC and NIH should have established with the ASRT in Egypt a system for instrumentation maintenance and repair and for procurement capability that will allow continuity of those efforts.

VII. National Bureau of Standards

A. The program of NBS with the NIS and EOS proceeds according to schedule. However, since the cost of instrument acquisition has increased, the JCC recommends that an increase of \$110,000 be

made for the instrumentation area. Moreover 50,000 U.S. dollars from the money allocated for training expenses will be used for the purchase of standard reference materials.

B. Calibration and standardization activities must be maintained in the future. NBS proposes that plans be made for calibration and information exchange beyond the project completion date (October 1985) so that these activities may continue.

VIII. New Crops for Arid Zones

The JCC affirms its judgment that the vigorous pursuit of the appraisal of land reclamation in Egypt is of the highest priority.

In order to cover this need, funds under the arid lands demonstration project will be reallocated to:

- Perform a rapid reappraisal of Egyptian land reclamation experience along the lines submitted to the JCC and annexed to this report, including experience and suggestions on irrigation systems from other countries, with special reference to the United States.

- At the same time an evaluation of land reclamation technology in a demonstration area will be outlined with the intention of allocating other funds that might be made available for the needed field studies from monies of the Applied Science and Technology Research Program, and from other sources.

A brief description of the rapid appraisal and an outline of the technology evaluation in a demonstration area were approved. (See Annex A)

X. Science and Technology Policy Studies

The JCC noted with appreciation the two complimentary activities established early this year in the S&T Policy project. The plans, work schedule, and objectives of each approach were explained by Dr. M. Kamel and Dr. Essam Galal. During the discussion that followed, it was pointed out that the enthusiasm and momentum achieved thus far might be dissipated by inability to provide funding support from the ASRT's designated Incentives Fund and the project operating budget. The JCC recommended an urgent effort by all concerned to loosen the restrictions that inhibit appropriate funding for this essential activity.

X. Research and Development Management Project

The JCC received and noted with appreciation the summary and action program reports for the R&D Management Project. In particular efforts to institutionalize management training in Egypt by a group from the ASRT and NRC/Cairo were commended. The proposed action plan and schedule were endorsed with the suggestion that they be implemented expeditiously, but with flexibility to allow the incorporation of new opportunities as they arise. One example of such an opportunity is the interaction with the planning and management of the ASRT Five Year S&T Program (Recommendation III).

XI. Red Sea Fisheries

The JCC noted with appreciation the report of progress in the Red Sea Fisheries R&D Project. Particular interest was expressed in the

field activities which commenced early in 1983. The JCC looks forward to the opportunity to review and discuss the program status report available in November 1983, which will include:

- The physical features (topography, climate) of the area.
- Socio-economic study of the population (trends for future development).
- Summary of the previous works on the aquatic environment and fisheries of the area.

Results of fishery investigations (including fish species; species composition; types and size of commercial fishing boats; fishing gears; catch per unit effort; nature, size and site of fish landings).

XII. Food Technology Pilot Plant

The JCC recognized that a site and construction funds for a Food Technology Pilot Plant at the National Research Centre have been provided by the Government of Egypt and recommended that the project be implemented as rapidly as possible.

XIII. Regional R&D Centers

The JCC received background information on possible establishment of regional R&D centres in Egypt and on relevant U.S. experience of the Cooperative-State Agricultural Research Centers and recommended:

- That further study and evaluation of the experience of countries such as Mexico, India and Korea be undertaken under an appropriate plan.
- That centres to deal with regional needs be established in Egypt in so far as satisfactory funding and full-time staff become available.

- That the mission for each regional centre be clearly defined.
- That maximum utilization be made of existing university and ministry R&D facilities.

XIV. JCC Meeting XII

The JCC members agreed to hold the next meeting (JCC-XII) at the ASRT in Cairo, November 20-22, 1983. That meeting will be preceded by Seminar III of the S&T Policy Measures Project on November 16-17, 1983. Field visits to the various projects will be scheduled on November 18 and 19.

Annex A

A PROJECT OUTLINE: EVOLUTION OF REPRESENTATIVE LAND RECLAMATION
PROJECTS IN EGYPT

BACKGROUND

Large scale land reclamation projects have been completed in Egypt during the past thirty years. Some of these projects have achieved their targets, others failed to meet the objectives set for them.

Different evaluation studies were carried out by the different agencies. In the absence of an agreed upon methodology of evaluation, different and contradicting conclusions were reached by different evaluation teams. It now appears of prime importance to review, analyze and reevaluate these studies along an agreed upon methodology with the objective of synthesizing a complete and integrated evaluation.

OBJECTIVES

Reevaluate previous evaluation studies along an agreed upon methodology with the objective of synthesizing a complete and integrated evaluation of representative major land reclamation projects.

IMPACTS OF THE STUDY

1. The results of the reevaluation study will provide a better guide for proper planning, design, execution, settlement and management of new and existing reclamation project.
2. Introduce proved technology of land reclamation and development either directly or after adaptation to different new reclamation projects.

WORK PLAN

1. Collect and assemble available information.
 2. Preliminary review of available information to identify gaps and differences.
 3. Develop methodology for evaluation.
 4. In the reevaluation exercise, the following aspects will be considered:
 - i) Simple economic criteria.
 - ii) Use of social cost benefit criteria.
 - iii) Use of multiple objective criteria, i.e., food sufficiency, development of new communities, environmental stability, etc.
- Assess the interaction among different factors, needed for maximizing returns from land, water and human resources in new land reclamation projects.
- Analyze data and draw up conclusions.
- Draft report.
- Final report.

Duration of project: 10 months

MONTHS

ACTIVITY	1	2	3	4	5	6	7	8	9	10	11	12
Assemble Information	—											
Preliminary Review	—	—										
Development Methodology			—	—								
Assessment of Physical, Economic and Social Aspects				—	—	—	—	—	—			
Reporting									—	—		

STAFFING

m/m

Consultants (Egyptians)	3 x 10 = 30
Consultants (American)	3 x 2 = 6
Supporting Staff Assistants	3 x 5 = 15
Secretarial work	= 10

EXECUTIVE AGENCY

Agriculture and Food Council of ASRT in cooperation with Ministry of Land Development and Reclamation

BUDGET

Consultants	\$150,000
Supporting Staff	20,000
Computer Services	25,000
Transportation (local, international)	40,000
Printing of reports	10,000
Subtotal	245,000
Contingencies	25,000
Total	270,000

Annex B

Preliminary Agenda

Eleventh Meeting, Joint Consultative Committee
Applied Science and Technology Research Program
Egyptian Academy of Scientific Research and Technology (ASRT)
National Research Centre (NRC/Cairo)
U.S. National Academy of Sciences/National Research Council (NAS/NRC)

Washington, D.C., U.S.A.

May 9-11, 1983

Monday, May 9, 1983

Board Room, NAS Building
2101 Constitution Ave., N.W.

Morning Session

9:30 a.m.	Welcome	Gilbert White, Chairman U.S. Panel JCC
		John Hurley, Director NAS Board on Science and Technology for International Development
	Response	Ibrahim Badran Chairman, JCC
	Remarks	Mr. Kenneth Sherper Director, Office of Technical Support, Bureau of Near East
10:15 a.m.	NRC Status Report	Mohamed Kamel Director, NRC
10:30 a.m.	Administrative & Management Report	A.S. El-Nockrashy General Coordinator Applied S&T Research Program
10:45 a.m.	NAS/NRC Report	Leo Packer NAS/NRC Resident Program Manager in Cairo
11:00 a.m.	Break for Coffee	
11:15 a.m.	Instrumentation Technology	M. Shaloot, ASRT, Cairo N. Huston, U. Wisconsin/Madison H. Metz, NIH, Bethesda
11:45 a.m.	Standards and Measurements	A. F. Dawoud, NIS, Cairo K. Heinrich, NBS, Washington
12:00 noon	Scientific and Technical Information Systems	Nabil Ali and V. Slamecka, Georgia Tech

Monday, May 9, 1983 (Continued)
Board Room, NAS Building
2101 Constitution Ave., N.W.

12:30 p.m. Luncheon honoring
JCC Members
Lecture Room, NAS

Executive Afternoon Session

2:00 p.m. ASRT 5-Year Program in I. Badran, President
Science & Technology ASRT

2:45 p.m. o Background Description
and Administration

o Comments and Discussion

4:00 p.m. Executive Session
Preparation of Conclusions
and Recommendations

4:30 p.m. Adjourn

Tuesday, May 10, 1983
Room 351, Joseph Henry Building
2100 Pennsylvania Avenue, N.W.

Morning Session

9:30 a.m. Towards a Technology
Policy for Egypt

A. The Sector Studies Approach M. Kamel, Director, NRC

B. The Policy Framework Approach Essam Galal, S&T Policy Project

11:00 a.m. Break

11:15 a.m. Technology Transfer: J. Gibbons and
Case Study by the Office M. C. Harris
of Technology Assessment Congressional Office of Technology
Assessment

12:30 p.m. Break for Lunch

Tuesday, May 10, 1983 (Cont'd.)
Room 351, Joseph Henry Building
2100 Pennsylvania Avenue, N.W.

Afternoon Session

- 1:30 p.m. Major Issues Considered
by JCC-X
- o Arid Lands/Land Reclamation M. El Gabaly
 - o R&D Management Program A. S. El Nockrashy
 - o Red Sea Fisheries A. S. El Nockrashy
 - o Food Technology O. Galal
 - o Pilot Plant Project
- Open Discussion
- 3:30 p.m. Executive Session
Preparation of Conclusions
and Recommendations
- 4:30 p.m. Adjourn

Wednesday, May 11, 1983
Room 351, Joseph Henry Building
2100 Pennsylvania Avenue, N.W.

Morning Session: Future Orientation

- 9:30 a.m. Regional Research I. Badran
System: Description
of an Egyptian Need
Discussion
- National Agricultural M. Carter
System: Cooperative State C. Harris, US Dept.
Research Service of Agriculture
Discussion
- 10:30 a.m. Marketing of R&D M. Kamel
Services at the
Governorate Level
Discussion
- Feasibility of an To be determined
Industrial Research
and Extension System
Discussion
- 11:30 a.m. Recommendations and Conclusions
- 12:30 p.m. Adjourn

May 6, 1983

Preliminary List of Participants, Invited Guests, and Observers

Eleventh Meeting
Joint Consultative Committee
Applied Science and Technology Research Program

Washington, D.C.

May 9-11, 1983

Egyptian JCC Members

Dr. Ibrahim Badran
President, Academy of Scientific Research and Technology (ASRT)

Dr. Abdel Aziz Hegazy
Counselor, ASRT

Dr. Hassan Ismail
Counselor, ASRT

Dr. Mostafa El-Gabaly
Counselor, Ministry of Agriculture

Dr. Mohamed El-Kassas
Professor of Botany, Cairo University, and
Counselor, ASRT

U.S. JCC Members

Dr. Gilbert White
Institute of Behavioral Sciences
University of Colorado

Dr. George Bugliarello
President, New York Polytechnic Institute

Dr. Mary E. Carter
Associate Administrator, Agricultural Research Service
U.S. Department of Agriculture

Dr. James Hillier
International Consultant

Dr. F. Karl Willenbrock
School of Engineering and Applied Science
Southern Methodist University

Dr. Leo S. Packer (ex officio)
NAS/NRC Resident Program Director in Egypt

Egyptian Advisors

Dr. Mohamed Kamel
Director, National Research Centre (NRC/Cairo)

Dr. Yehia Kabil
Cultural Counselor, and
Director, Education Bureau
Embassy of Egypt, Washington

Dr. Mahmoud Mahfouz
Advisor to the President, ASRT

Dr. Esam Galal
Advisor to the President, ASRT

Dr. A. S. El Nockrashy
Director, International Secretariat, ASRT, and
General Coordinator, Applied S&T Research Program

Dr. Osman Galal
Head, Child Health Lab, NRC/Cairo;
Director, National Institute of Nutrition, and
General Coordinator at NRC/Cairo for Technical Aspects of the Program

Dr. Abdel Fatah Dawoud
Director, National Institute for Standards

Eng. M. Shaltoot
Instrumentation Project Director, ASRT

Dr. Nabil Ali
Scientific and Technical Information Project Director

Mr. Galal Tawfeek
Public Relations Department, ASRT

NAS Board on Science and Technology for International
Development

Mr. William A. W. Krebs, Vice President
Arthur D. Little, Inc.
Chairman, BOSTID Committee on Program Evaluation

Dr. Ralph Smuckler, Dean
International Studies and Programs
Michigan State University
Member, BOSTID Committee on Program Evaluation

National Academy of Sciences

Dr. Victor Rabinowitch
Executive Director
Office of International Affairs

Mr. John Hurley
Director
Board on Science and Technology for International Development

Mr. Jay Davenport
Senior Staff Officer, Egypt Program, BOSTID

Mr. Augustus Nasmith, Jr.
Staff Officer, Egypt Program, BOSTID

Mrs. Maryalice Risdon
Staff Associate, Egypt Program, BOSTID

Mrs. Eileen Payne
Administrative Secretary, BOSTID

Agency for International Development/Cairo

Dr. Howard Lusk
Associate Director, Human Resources Development Cooperation
USAID Mission in Cairo

Mr. James B. Riley
Head, Science and Technology Division
USAID Mission in Cairo

Dr. Sherif Arif
Science and Technology Division
USAID Mission in Cairo

Agency for International Development/Washington

Dr. Nyle C. Brady
Senior Assistant Administrator
Bureau for Science and Technology

Dr. Howard Minners
Science Advisor, Office of the Administrator

Dr. John Daly
Office of the Science Advisor

Dr. John Eriksson
Deputy Assistant Administrator for Research
Bureau for Science and Technology

Mr. Richard Tropp
Special Assistant to the Administrator

Mr. Dennis Morrissey
Deputy Director, Office of Egypt Affairs
Bureau for Near East

Mr. Ken Scofield
Desk Officer, Office of Egypt Affairs (NE/E)
Bureau for Near East

Mr. Bert Porter
Assistant Desk Officer, NE/E
Bureau for Near East

Mr. Kenneth Sherper
Director, Office of Technical Support (NE/TECH)
Bureau for Near East

Dr. Barry Heyman
Director, Human Resources and Science and Technology Division
(NE/TECH/HRST)
Bureau for Near East

Ms. Carolyn Coleman
Program Analyst, NE/TECH/HRST
Bureau for Near East

Mr. James Bever
Advisor, NE/TECH/HRST
Bureau for Near East

Department of State

Mr. Edmund H. Kelly
Office of Cooperative Science and Technology Programs
Bureau of Oceans and International Environmental and
Scientific Affairs

Department of Agriculture

Dr. Clare I. Harris
Acting Administrator
Cooperative State Research Service

National Bureau of Standards

Dr. Kurt Heinrich
Chief, Office of International Relations

Mrs. Doris Bluebond
Program Analyst, Office of International Relations

National Institutes of Health

Mr. Howard Metz
Biomedical Engineering and Instrumentation Branch

Office of Technology Assessment, U.S. Congress

Dr. John Gibbons
Director

Dr. Martha Caldwell Harris
Project Director
Technology Transfer to the Middle East

Georgia Institute of Technology

Dr. Vladimir Slamecka
School of Information and Computer Science

University of Wisconsin

Dr. Norman Huston
Director
Instrumentation Systems Center

Mr. Edward Falk
Instrumentation Systems Center

Attachment II

ANNOUNCEMENT: Call for Letter Proposals

Research and Development Management Training Activities
in Egypt

Sponsoring Organizations: Egyptian Academy of Scientific Research and Technology, U.S. National Academy of Sciences/National Research Council (Under Contract NEB-0016-C-00-1058-00 with the U.S. Agency for International Development).

Activities: Seminar in R&D Program Management. (One week of 5 consecutive days, 4 hours per day, between August 28 and September 14, 1983) The target audience will be experienced (approx. 30) R&D project/program leaders from industrial, agricultural and health related applied research institutions in Egypt. The language of instruction is English. Creative use of case studies, audio-visual materials and participant interaction must be utilized. The site will be the National Research Centre (Cairo, Egypt). The Egyptian participants will not be housed together nor will they be available for interaction outside the scheduled seminar period. (See the attached outline of proposed seminar topics. Note: You are free to suggest other topics within the general theme.)

Date Letter Proposals Should be Submitted: Prior to June 22, 1983.

General Guidelines:

- Two seminar leaders for the activity should be adequate for this level of effort. Please submit summary resumes for the persons you recommend.
- International travel costs from the U.S.A. to Egypt and return plus local per diem in Egypt will be furnished directly by the sponsors. (Budget estimates included with a letter proposal should not include these costs.)
- Seminar preparation time in the U.S.A. must be limited; candidates are expected to be well versed and prepared in the topics which are listed in the attachment to this announcement.
- In-Egypt orientation/preparation time may be proposed. In lieu of this the sponsors may elect to send a representative from Egypt for discussions in the USA prior to the holding of the activity in Egypt.
- Letter proposals should be short and concise. Resumes of the individuals proposed need not give a detailed bibliography of

R&D publications but should clearly indicate relevant experience as seminar leaders. Separate annexes giving institutional descriptions/capabilities/experiences in Egypt and/or other developing countries are welcome.

- A proposed detail budget must accompany a letter proposal.

Address to Submit Letter Proposal

Mr. Jay Davenport
Egypt Program, JH 219
National Research Council
2101 Constitution Avenue, N.W.
Washington, D.C. 20418

PROGRAM MANAGEMENT

1. Proposal/Project Evaluation
 - a. Compliance of proposal with established program goals
 - b. Clarity of problem statement, objectives, definition of outputs, project milestones, scheduling, cost estimates
 - c. Assessment of background data
 - d. Relevance to needs of end-users
 - e. Selection priorities
2. Monitoring Projects
 - a. Assessment of accomplishments at periodic intervals
 - b. Compliance with milestone projections and scheduling
 - c. Project leader reports
 - d. Sector project review seminars
3. Criteria for Terminating Non-Productive Projects
 - a. Evaluation of progress and results
 - b. Judgment based on project monitoring
 - c. Deviation from milestone charts and project objectives
 - d. Recognition that project objectives cannot be met due to technical or other reasons
4. Mechanisms for Re-Directing Projects
 - a. In-depth evaluation, particularly if project is in trouble
 - b. Revise proposal/project objectives and schedules
 - c. Alternatives to project re-direction
 - d. Change of leadership
5. Fiscal and Technical Reporting and Controls
 - a. Project cost accounting related to milestone charts, schedules, and budgets
 - b. Quarterly financial and technical reports
 - c. Incremental funding contingent on adequate reporting
 - d. Project leaders responsibilities

Attachment III
TRAVEL TO EGYPT

April 1 - June 30, 1983

<u>NAME</u>	<u>DATE</u>	<u>PURPOSE</u>
<u>PROGRAM PLANNING AND MANAGEMENT</u>		
1. Jay Davenport Staff Officer, NAS/NRC, Washington	March 29-April 20	Preparations for JCC-XI; program planning with emphasis on R&D management activities, bentonites and pharmaceuticals R&D projects, and More and Better Food demonstration project; contract extension and program evaluation.
<u>INVESTIGATION AND EVALUATION OF EGYPTIAN BENTONITES FOR INDUSTRIAL APPLICATIONS</u>		
2. Donald J. Weintritt Weintritt Testing Laboratories Lafayette, Louisiana	April 21-28	Advisory assistance re alkali activation of bentonite clays for applications in drilling lubricants and foundry casting operations.
<u>MORE AND BETTER FOOD</u>		
3. C. O. Chichester* Vice President The Nutrition Foundation Washington, D. C.	April 27-May 5	Consultation on nutrition/food technology issues
<u>DEVELOPMENT AND APPLICATION OF BIOGAS TECHNOLOGY IN RURAL AREAS OF EGYPT</u>		
4. Harold Capener Department of Rural Sociology Cornell University Ithaca, N. Y.	May 25-June 11	Meeting of Biogas panel with NRC research team Visits to demonstration villages re sociological considerations
	June 27-29	Discussions in Washington with NAS staff, AID/ Washington staff, and Dr. M. El-Halwagi re 1984 international biogas conference
5. Philip Goodrich Department of Agricultural Engineering University of Minnesota St. Paul, Minn.	June 4-9	Meeting of Biogas panel with NRC research team

*Transportation provided by another source.

TRAVEL FROM EGYPT
April 1 - June 30, 1983

NAME	DATE	PURPOSE	PLACE
<u>PROGRAM PLANNING & MANAGEMENT</u>			
1. A. S. El-Nockrashy	April 30-May 26	11th JCC Meeting and program planning	NAS, Washington, D. C. James Blackledge, Consultant, Denver, Colo. Denver Research Institute, Denver, Colo. Food Protein R&D Development Center, Texas A&M Soliman Shenouda, Consultant, General Foods, Tarrytown, N.Y.
2. Osman Galal	May 2-21	11th JCC Meeting and program planning	NAS, Washington, D. C. International Nutrition Program, Purdue University James Blackledge, Consultant, Denver, Colo. Denver Research Institute, Denver, Colo. Center for Disease Control (CDC), Atlanta, Ga. Nutrition Dept., Tulane Univ., New Orleans, La. Soliman Shenouda, Consultant, General Foods, Tarrytown, N.Y.
3. Leo Packer	April 28-May 28	11th JCC Meeting and program planning	Washington, D. C.
4. Ibrahim Badran	May 8-15	11th JCC Meeting	Washington, D.C.
5. Hassan Ismail	May 1-12	11th JCC Meeting and S&T Policy visits	Washington, D.C. MIT, Cambridge, Mass. Harvard University, Cambridge
6. Abdel Aziz Hegazy	May 1-12	11th JCC Meeting and S&T Policy visits	Washington, D.C. MIT, Cambridge, Mass. Harvard University, Cambridge New York University

NAME	DATE	PURPOSE	PLACE
7. Mostafa El Gabaly	May 4-12	11th JCC Meeting and S&T Policy visits	Washington, D.C.
8. Mohamed El Kassas	May 7-14	11th JCC Meeting	Washington, D.C.
9. Mohamed Kamel	May 7-13	11th JCC Meeting	Washington, D.C.
10. Galal Tawfik	May 8-29	11th JCC Meeting and science information activities	Washington, D.C. Boston University and MIT, Cambridge, Mass.
<u>SCIENCE & TECHNOLOGY POLICY MEASURES</u>			
11. Mahmoud Mahfouz) 12. Essam Galal)	May 1-12	S&T Policy discussions, 11th JCC Meeting	Technology Adaptation Program, MIT, Cambridge, Mass. Center for Policy Alternatives, MIT J.F.Kennedy School of Govt., Harvard Univ., Cambridge Center for Science & Technology Policy, New York Univ. Program on Policy Studies in S&T, George Washington Univ., Washington, D.C. Office of S&T Policy, Executive Office of the President, Washington, D.C. Office of Technology Assessment, Washington, D. C. National Science Foundation, Washington, D.C.
<u>R&D MANAGEMENT SYSTEMS</u>			
13. Mohamed M. El-Halwagi Head, Pilot Plant Laboratory, NRC, Cairo	June 11-29	Special Summer Program: Management of Research, Development, and Technology- based Innovation Discussions re Biogas Project	MIT, Cambridge, Mass. AID, Washington, D.C. World Bank, Washington, D.C. NAS, Washington, D.C.

NAME	DATE	PURPOSE	PLACE
<u>DEVELOPMENT AND APPLICATION OF BIOGAS TECHNOLOGY IN RURAL AREAS OF EGYPT</u>			
14. Mohamed A. Hamad Asst. Professor, Pilot Plant Laboratory, NRC, Cairo	May 1-30	Conference on Biomethanation Systems Fact-finding re biogas experience in rural areas	Bangkok, Thailand National Institute of S&T, Manila, Philippines Institute of Agricultural Science, Seoul, Korea National University, College of Agriculture, Seoul, Korea Bio-energy Laboratory, Chengdu Institute of Biology, Chengdu, Sichuan, China Guangzhou Institute of Energy Sources, Guangzhou, China Indian Institute of Technology, Bombay, India Khadi Village Industries Commission, Gobar Gas R&D Center, Bombay National Institute of Waste Recycling Technology, Bombay Indian Institute of Science, Center for Application of S&T for Rural Areas, Bangalore, India
15. Samy El-Afifi Asst. Professor, Pilot Plant Laboratory, NRC, Cairo	June 2-30	Training courses on atomic spectroscopy and gas chromatography Instrumental methods for analysis of organic pollutants and toxicants in wastewater	Perkin-Elmer Corporation Norwalk, Conn. Metropolitan Sanitary District of Greater Chicago
16. Mohamed A. Khalafallah Researcher, Soil and Water Use Laboratory, NRC, Cairo	June 5-24	Study/orientation in nitrogen fixation by microbial populations, fluorescent antibody techniques for soil microbial ecology 9th North American Rhizobium Conference	Department of Soil Science, University of Minnesota, St. Paul, Minn. Boyce Thompson Institute, Cornell University, Ithaca, N. Y.

NAME	DATE	PURPOSE	PLACE
<u>CORROSION CAUSES AND CONTROL</u>			
17. Abdel Ghany El Hosary Research Professor, NRC, Cairo	May 9-28	Fact-finding re corrosion inhibitors	Center for Surface and Coatings Research, Lehigh Univ., Bethlehem, Pa. Fontana Corrosion Center, Ohio State Univ., Columbus Mobil R&D Laboratories, Dallas, Texas Unichem International, Hobbs, New Mexico Amoco Research Center, Naperville, Illinois Dallas, Texas
		International Conference on Corrosion Inhibition	
<u>PREPARATION OF SELECTED PHARMACEUTICAL CHEMICALS</u>			
18. Mohamed B. Fayez Vice President, Academy of Scientific Research and Technology, Cairo	April 13-23	Fact-finding re industrial scale-up factors and opportunities for training in U.S. industries	Food & Drug Administration, Washington, D.C. Ciba-Geigy Co., Cranston, R.I. Creighton University, Omaha, Nebraska Merck Sharp & Dohme Research Labs, Rahway, N. J. The Upjohn Company, Kalamazoo, Mich. National Science Foundation, Division of Science Resources Studies, Washington, D.C.
		S&T policy discussions	