APPLIED SCIENCE AND TECHNOLOGY RESEARCH IN EGYPT

Quarterly Report No. 13 - Phase II
October - December 1984

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INTRODUCTION

This is the thirteenth quarterly report, Phase II of the Applied Science and Technology Research Program in Egypt covering the period Ocotber - December 1984. The program is supported 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).

This report gives a summary of principal activities for the months October through December 1984. An overview of each project for Phase II (July 1981 - March 1984) was given in the tenth quarterly report (January - March 1984); a summary for Phase I (1978-81) was prepared in June 1982.

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Phase II: Thirteenth Quarterly Report
October - December 1984

A. Policy Planning and Management

1. Joint Consultative Committee (JCC)

The fourteenth regular meeting of the Joint Consultative Committee (JCC XIV) was held at the headquarters of the Academy of Scientific Research and Technology (ASRT) in Cairo, Egypt, October 21-22, 1984. This was the last JCC meeting with Dr. Ibrahim Badran serving as ASRT President; all of his colleagues expressed their appreciation for his leadership of the Committee and for his contributions to Egyptian-American programs in science and technology.

Major program elements discussed at JCC XIV and actions taken were:

Program Element	Summary of Action
• R&D Management Systems	• JCC reviewed and discussed ASRT/NRC activities and program plans.
	• JCC commended the ASRT/NRC Mgt Committee for actions that point the way to new R&D Mgt systems at the two institutions.
• S&T Policy Measures	• JCC recommended to AID and ASRT a series of sectoral S&T policy planning meetings.
	• JCC recommended further action toward a technology policy statement and continuing policy planning process in Egypt.
• More and Better Food	• JCC reviewed a report of village activities stressing crop productivity improvements, child health initiatives,

	nutrition education, and special activities of women in village development.
	• JCC stressed importance of strengthening social-economic dimensions of the MBF project.
	• JCC recommended emphasis on a more broadly based rural development program with Ministries and the private sector.
• Land Reclamation	• JCC discussed a comprehensive report of project goals and project design from Dr. Hassan Wahby, Water Research Institute, Ministry of Irrigation.
	• JCC urged AID endorsement of the project for evaluation of Land Reclamation which is already supported by ASRT R&D program. Funds from Applied S&T Research Program would support the two-year assessment of social, economic and institutional aspects plus purchase of equipment.
• Science and Technology Information	• JCC received a report from the STI Project Executive Committee stressing activities on "information awareness" and new methods of governance for STI network.
	• JCC stressed the need for an incentive payment plan for the working nodes.
• Standards and Measures	• JCC received a status report reviewing equipment procurement, planning for a building technology workshop and a fire research workshop, and for additional international assistance for standards and measures when the present programs are completed in 1986.

• Instrumentation Technology/ Scientific Equipment Maintenance	• JCC received a status report of activities and outline of activities for the final year of the project.
• Program Plan and Budget Reallocation	• JCC noted a report on program and budget and urged that reallocations which are continuously reviewed, be discussed at its JCC XV.

A summary report of JCC XIV is included as Annex A to this quarterly report.

2. S&T Policy Measures

No report for the September - December 1984 time period.

3. R&D Management

In a summary presentation to JCC XIV, Dr. A. S. El Nockrashy, ASRT Program Coordinator for the Applied Science and Technology Research Program, discussed institutionalization of R&D management activities. That activity is "on the road" toward a goal of full incorporation of strong and indigenous R&D management systems in Egyptian research organizations. "Institutionalization" as used in this context is understood to consist of two elements.

- Manpower development and the capacity within Egypt to offer a variety of R&D management training experiences at introductory and advanced levels, and
- Organization, or institution systems development.

Since 1979, 58 persons from Egypt have participated in specialized R&D management training courses at the Denver Research Institute, Battelle, MIT and other United States institutions. In

nine all-Egyptian programs, over 550 participants from the ASRT, NRC and from ASRT affiliated institutes, universities, ministries and public sector firms have been given basic orientation on the principles of R&D project and institution management. This reflects an encouragingly ambitious and comprehensive high-level of continuing effort for R&D management training by ASRT and NRC.

Actions have also been taken toward the long-term goal of institutionalizing "organization" development. In July 1984 the ASRT President created a 10-member Committee for the Development of R&D Management Systems in the ASRT and the NRC. The Committee is chaired by Dr. M. Kamel (then NRC Director but since November 1984 the new ASRT President) and includes both ASRT Vice Presidents as well as key program directors from NRC. The Committee's assignment is to assess existing ASRT and NRC management systems to identify areas for development. Inputs from the Applied Science and Technology Research Program can be used in the assessment process and in specific actions for changing the organization/management systems.

The Committee has recognized both short-term opportunities for change and development of management systems in ASRT and NRC and the fact that a long-term plan, which might embrace additional ASRT affiliated institutes, merits its attention. A draft short-term plan was prepared for discussion and review. It was found to be more applicable to the NRC than to the ASRT; therefore, elements of the short term plan are to be implemented only in NRC at this time. By definition of the Committee, "short-term" is understood to mean until October 1986, the termination date for the Applied

Science and Technology Research Program with AID. The "long-term" effort is understood to be one that can and should begin simultaneously with a "short-term" effort but must continue in a systematic manner for a period of 3 to 5 years beyond the October 1986 date. Among the elements of the short-term plan that are to be implemented at NRC are:

(a) continuation of management training for R&D project managers, (b) expansion of the cadre of persons who are trainers ("Training of trainers"), and (c) extending the R&D marketing activities of NRC along the lines which were demonstrated in the metallurgical, ceramics and phosphates industries.

To prepare a more comprehensive long-term R&D management development plan, a review of the system at NRC was undertaken with the help of a consultant from the National Institute for Management Development, sometimes known as the Sadat Institute for Higher Management. A management needs and systems overview (or perception of constraints and authority) was made and preliminary conclusions were discussed among a broad cross section of NRC technical and administrative leaders. The assessment process was temporarily halted at the time Dr. Kamel moved from his position as NRC Director to that of ASRT President but is expected to be resumed early in 1985.

B. Summary of Project Status

1. More and Better Food

During November Dr. Cheryl Rittenbaugh, Associate Coordinator for Nutrition Programs, Department of Family and Community

Medicine, University of Arizona worked with a group of NRC scientists in the More and Better Food (MBF) program. Their task is to gather and analyze data on health profiles of villagers and determine if the agricultural innovations and nutrition (food supplement) interventions of the MBF project can, even at this early stage, show relationships. The information is needed for an overall examination of lessons learned from MBF and for better utilization/adaptation of MBF experience in the design of more comprehensive, integrated rural development plans.

In December Dr. Andrew W. Nichols, Director of the Rural Health Office, Department of Family and Community Medicine, University of Arizona, spent two weeks working with Dr. Osman Galal and Dr. Ali Zein El Abedeen on the child health/nutrition aspects of MBF. The group is particularly focusing upon educational efforts to catalyze individual and group (village) responsibility for maintenance of clean water supply systems and improved sewage disposal methods.

It is through the interaction of researchers such as Drs. Galal, Rittenbaugh, El Abdeen and Nichols with a large number of village participants, health care delivery professionals, Ministry officials and others that a comprehensive NRC plan, incorporating health/nutrition information from MBF and from the Collaborative Research Support Program (CRSP), will evolve. The goal is to propose a more comprehensive model and a more pragmatic approach to integrated agricultural, health, and nutritional development for Egyptian villages as part of the National Development Plan.

2. Biogas Technology

The International Conference on Biogas Technology, Transfer and Diffusion, held in Cairo November 17-24, 1984, marked the last major activity of the biogas demonstration project. Sponsors of the conference, in addition to the Applied Science and Technology Research Program, included the Egyptian Academy of Scientific Research and Technology (ASRT) and its affiliated National Research Centre (NRC) and the Bioenergy Systems and Technology (BST) project of the U.S. Agency for International Development. Dr. M. M. El Halwagi, principal investigator for the biogas project, served as conference coordinator and was assisted during the 18-month period of conference preparations by NAS/NRC advisory committee members Philip Goodrich, Harold Capener, and T. B. S. Prakasam along with BST staff members. The conference afforded an opportunity to more than 135 participants from 38 countries to review the present status of biogas technology, to assess its viability, and to propose future courses of action for its development and application. Emphasis was directed at developing country experience, with more than 75% of the attendees representing developing country research institutes, universities, government ministries, and private industry.

At the opening session of the conference, participants were welcomed by the new President of the ASRT, Dr. Mohamed Kamel, by Dr. M. El Halwagi, (Conference coordinator), Dr. Paul Weatherly (AID Office of Energy), and by Dr. Bernard Wilder (AID Mission in Cairo). Five overview papers were presented to set the stage for the more specifically targeted topics of the technical sessions.

Overview papers included: a) a review of the current state-of-the-art of biogas technology, including technical, economic, social and institutional aspects; b) a review of the numerous resource, environmental, engineering, and social constraints on the use and diffusion of the technology with a cautionary note against underestimating the combined impact of these constraints; c) an analysis and grouping of ways to exploit biogas technology transfer and diffusion using "force-field analysis" to identify means of minimizing constraints and maximizing driving forces inherent in biogas systems; d) a survey of information needs for diffusing biogas technology into rural areas of developing countries, and e) an examination of an ongoing integrated biogas demonstration project in Saipan which has been successful in solving waste disposal and pollution problems and in producing renewable fuel, fertilizer, feed, food and various raw materials to meet the basic needs of the local population.

The conference format included technical sessions, thematic sessions, roundtables, and poster sessions, along with a one-day field trip to biogas installations at the NRC and two villages near Cairo. The technical sessions focused on such subjects as engineering design of simple and complex biogas systems, bioconversion, use of alternative feedstock materials, use of digested materials, and control of pathogens and parasites. Thematic sessions included non-technical aspects of biogas development such as cultural constraints to successful transfer and diffusion of biogas technology, optimization strategies for promoting biogas applications, and cost-benefit analysis of biogas

systems. Roundtables were for the presentation of individual country programs, regional programs and networks, and the discussion of the role of bilateral and international donor agencies in facilitating bioenergy development. Poster sessions featured specific technical and country program exhibits and promoted interaction among participants in exchanging information about action-oriented programs.

A draft executive summary of conference findings was presented at the closing session, and participants were asked to provide comments and suggestions. The final document is being prepared in Cairo and will be distributed upon completion by Dr. El Halwagi. Preliminary recommendations and conclusions are outlined in five areas:

(a) Technical

Basic research is best carried out in developed countries; applied research should be stressed in developing countries. Strong linkages should be forged between institutions in the two groups of countries to facilitate transfer of basic knowledge into practical applications.

Specific areas for attention include applied research on batch digesters and plug flow digesters, optimization of digester design and operation, digestion of wastes other than animal manure, fertilizer content of the slurry, heating of digesters, and mixing in digesters; more rigorous collection of baseline data; and standardization of data collection.

(b) Economic

Although it appears that the economic contribution of biogas to national energy budgets may be small, in rural areas the contribution may be substantial in improving living conditions.

Economic viability should be determined by considering all outputs of a biogas system (fertilizer, animal feeds, waste disposal, etc.), not just the energy produced. Including social cost/benefit analysis along with financial analysis will result in more positive conclusions about viability.

Small household digesters (approximately 10 cubic meters in size) appear to be less financially viable than larger community unit (approximately 50 cubic meters) due to economies of scale and smaller cash flows.

In many countries optimum use of biogas is discouraged by market distortions brought about by national policies on fuel and fertilizer subsidies.

More substantive data are needed based on a wider range of experience using various digester designs and feeds in different social and environmental situations in order to evaluate economic viability more realistically. (At present, most of the data on household and community level uses are derived from experience in India.) Furthermore, meaningful analysis of biogas systems is limited due to the difficulty of quantifying secondary benefits (e.g. improved public health, reduced deforestation, improved quality of life, etc.) and the lack of a commonly agreed-upon methodology.

(c) Social and institutional

More study is needed on the important role of social and institutional factors in the diffusion of biogas technology. Areas for investigation include the study of ways to create effective interdisciplinary teams to implement biogas information diffusion; social organization and institutional infrastructure required to develop and maintain broad-scale programs of biogas development; training requirements for supervision, operation, and maintenance of biogas systems at different levels of application; analysis of case studies in various countries; and more complete assessment of end-user needs to ensure that biogas is the optimum technique to meet these needs.

(d) Information processing and dissemination

Flow of information in biogas technology is hampered by inadequate communication among the various disciplines involved. Thus information reaching policy-makers is fragmented. There is need for a central organization to serve as a clearing-house in collecting and synthesizing information on biogas and other bioenergy techniques into summaries to be distributed worldwide. Regional subcenters could collection information on their own regions, coordinate research activities, and encourage standardization of data collection and reporting. Training courses and workshops would be useful mechanisms for transfer of knowledge.

(e) Technology transfer

In the case of biogas technology, the paramount issue in technology transfer does not involve links between the developed and developing world as much as it does linkages among the

developing countries themselves. Here one finds most of the expertise and experience associated with the application of the technology. Mechanisms to facilitate cooperation and communication between these countries, such as training workshops, exchange visits and consultation should be explored.

In summary, the conference participants agreed that biogas technology is a viable option in developing countries to mitigate some of the more pressing problems these countries face in areas such as energy, public health, and agricultural productivity. However it was recognized that biogas is not the only option available. Additional study is needed to define more closely the social, economic and technical "niches" where biogas is the optimum choice for the policy maker.

3. Arid Zones/Land Reclamation

Dr. Hassan Wahby, Director, Water Distribution and Irrigation Systems Research Institute of the Ministry of Irrigation and principal investigator for the ASRT-funded land reclamation R&D program presented a design document to the JCC outlining the objectives of the program, principal activities, and research schedule. The document, entitled "Technical and Socio-Economic Evaluation of the Irrigation Systems in New Lands and Their Impact on Crop Production, Soil Properties and Water Requirements" is available from the ASRT in Cairo or the NAS/NRC (Egypt Program) in Washington.

New lands which are the subject of the reclamation experiments and demonstration activities normally have soils and topography quite distinct from the alluvial lands which have been cultivated previously so productively over many centuries using inundation irrigation techniques. Water-conserving but technologically more complex irrigation systems are the subject of study in the reclaimed lands. Critical questions remain concerning the technical effectiveness and economic viability of these irrigation methods in relation to the physical environment. Equally important are the institutional arrangements for management of the new farming systems and the social acceptability that the systems may gain with the Egyptian farmer.

The ASRT land reclamation study is scheduled for a five-year period beginning in May 1984 and will examine irrigation-soil-crop nutrient-tillage and other relationships for three cropping years. The supplemental assistance to be provided by the Applied Science and Technology Research Program will extend for only two years (October 1984 - September 1986) and is intended to emphasize those social, economic and managerial (institutional) factors which are so important to the long-term success of land-use development systems. Examples of the kinds of analyses which will be fostered under the AID-funded portion of the Land Reclamation program are:

(a) Economic Evaluation: Capital costs in relation to benefits for sprinkler and drip irrigation equipment, maintenance and operating costs, energy requirements and costs, labor costs including training for operating and maintenance personnel, land preparation costs, etc.

(b) Social Network Evaluation: Management systems for the projects in private and/or public sector, on-farm management plan, farmers' methods of interacting with water management authority, etc.

(c) Settlement Study: Farmers' reasons for settlement in reclaimed land area, constraints/opportunities as perceived by farmers, institutional support systems in place, role of women in new areas as compared to previous home, farmers views on how to improve the new settlement, etc.

4. Evaluation of Phosphate Ores

The final scheduled technical visit to NRC for the Phosphate Ores R&D project was made by I. T. Rusli, a chemical engineer from the International Fertilizer Development Center, Muscle Shoals, Alabama, U.S.A., during the period November 19-December 20, 1984. This technical assistance mission was postponed approximately one year because of the delayed arrival and assembly of equipment comprising the wet acid conversion unit. A schedule was arranged with Engineer Rusli to participate in conversion runs and testing of products from beneficiated phosphate ores from the Nile Valley (Al-Sobeiya), Western desert region (Abu Tartur) and the Red Sea (Al-Hamrarwein). The acid conversion process involves continuous operation of equipment (3 shifts) to insure equilibrium conditions and extension of data to pilot-plant scale so that economic costs/benefits may be estimated. Results of the month long mission will be given in the next quarterly report.

5. Wool Scouring/Wool Wax Recovery

Project completed; final technical report submitted.

6. Corrosion Causes and Control

During the month of October 1984, Dr. M. T. Thomas, Staff Scientist, Materials Department, Battelle Pacific Northwest Laboratories, worked in Cairo at the NRC with the group responsible for the corrosion R&D project. The program had three phases:

- Provide training and instruction to NRC personnel on preventive maintenance, repair and calibration of the Perkin-Elmer Physical Electronics Model 550 ESCA/SAM system (a high-vacuum instrument for nuclear and ionic characterization of the surface structure of non-volatile solid materials using x-ray photoelectron spectroscopy coupled through a microprocessor with a scanning auger microscopy system).
- Present a short series of seminars on the applications of surface science to industrial problems, and
- Assist the NRC group in developing contacts with Egyptian industries.

The visit of Dr. Thomas represents a final technical assistance input to the corrosion R&D project under Phase II of the Applied Science and Technology Research Program. The Model 550 ESCA/SAM system is the principal instrument furnished under the program to upgrade facilities in the NRC Laboratory of Electrochemistry and Corrosion to state-of-the-art technology in surface science. It is a powerful tool for solving basic and applied problems in corrosion and catalysis. It is also a sensitive system that requires a

controlled atmospheric environment, skill in ultra-high vacuum techniques, and experience in data interpretation. In each of these areas training was given by Dr. Thomas. Furthermore, the maintenance contract for the ESCA is with Perkin-Elmer/Munich which means periodic, but expensive visits by a technician from Germany. If the NRC group is sufficiently skilled in preventive maintenance and knowledgeable about the system, they can "trouble-shoot" by telephone with the maintenance specialists in Germany. During two of the four weeks that Dr. Thomas was in Cairo a maintenance engineer from Perkin Elmer/Munich was also present. Thus reinforcement of the training on the system was given on-site. Many of the complex procedures were video-taped for reference purposes and playback on future occasions. In the opinion of Dr. Thomas, the NRC group led by Dr. Talaat M. H. Saber and his five associates (including three from the Scientific Instruments Centre) have the necessary training and a supply of the most-needed spare parts to maintain the system and repair most of the common failures or accidental events that are likely to occur.

Dr. Thomas was invited to present a seminar to the Egyptian Corrosion Society; he spoke on "Application of Surface Science in Solving Corrosion Problems." The audience consisted of NRC scientists, university scientists, and technical persons from industry. Two additional technical lectures were given to invited groups from industry, universities and other NRC laboratories.

Although a specific seminar for industrial representatives was not given, contacts were made personally and by letter to industries in which the NRC facility could play a role in solving

surface science problems. As a result of these contacts two industries brought problems involving the poisoning of catalysts in fertilizer production to Drs. Saber and Thomas. Discussions were held on the services which Dr. Saber and his group can give in the solution of these problems. It was left to Dr. Saber to follow-through on the inquiries.

7. Red Sea Fisheries

Dr. Ehab Bebars, co-principal investigator for the Red Sea Fisheries R&D project, presented a progress report to JCC XIV summarizing technical activities during the months March-September 1984. Within the six-month time period seven field surveys, each of approximately 14 days duration, were conducted in the Foul Bay region. (Foul Bay is a remote section of the Red Sea adjacent to the Sudan-Egyptian border, whose shoreline is sparsely inhabited.) Information on the biological, chemical, and physical oceanography of the Bay is the basis for a long-term sustainable fisheries program. JCC requested that in the next report information be provided on the estimated magnitude of the present fisheries resource in the Foul Bay region, its ease of recovery, infrastructure needed for commercial exploitation, options for marketing the catch, and social-economic aspects of exploiting the fisheries resources.

8. Egyptian Bentonites for Industrial Application

One of the most promising aspects of the Bentonite R&D project has been the discovery of an extensive high-grade bentonite clay deposit along the Cairo-Alexandria Road. In conjunction with the

Egyptian Geological Survey an exploration of the extent of reserves and of the quality of the deposit has been undertaken. Drilling of ore samples has shown the bentonite deposit (in a well-defined area) to be about 2 meters thick and sufficiently extensive in its occurrence to be about 1.5 million tons of high-grade ore. The quality in the area surveyed is sufficiently uniform in analysis and of chemical composition to be utilized in drilling fluids (muds) for oil well exploration. (This is the use of highest cost/benefit potential.) Additional but very preliminary exploration at two nearby sites indicates there are further bentonite deposits of similar quality materials consisting of about 1 million tons of ore at each site. If the continuing testing proves that these preliminary findings are sustained, then Egypt for the first time will have an excellent source of bentonite clay materials for several important applications. The location adjacent to the Cairo-Alexandria desert road is such that it could be readily and rapidly developed.

9. Preparation of Selected Pharmaceutical Chemicals

Planning for pilot plant scale operation is essentially complete but bulk quantities of chemical intermediates have not arrived from the United States. A number of factors have complicated delivery of the required chemicals:

- Most are not off-the-shelf items and require long lead-times for procurement. The quantities, although large in the sense of laboratory-scale chemical procurement, are insufficient to warrant special production by suppliers for immediate delivery

to Egypt. Thus deliveries depend upon several independent orders to the suppliers in the U.S.A.

- Many are classified as hazardous, or at least require special precautions in handling and shipment. All of the bulk chemicals have been refused for air shipment. Some are restricted by ocean shippers to sea barge rather than scheduled container vessels. This greatly extends delivery times because the barges have irregular sailing schedules.
- Several of the chemicals require special license for export because they are under restrictions applying to materials destined for the Middle East (This is, in part, a consequence of the Iran-Iraq conflict.).
- Several intermediates require special permission to import into Egypt in the quantities involved because of Egyptian safety and/or security requirements.

The entire procurement/shipment schedule is under special review to determine if there are means to expedite the process.

DISCUSSION

A. Summary

Summary Status of Projects

Applied Science and Technology Research Program

October - December 1984

Project	Goals	Status
1. S&T Policy	• Complete all activities for Seminar III	• Final administrative details and outstanding financial obligations under reveiw.
	• Final report	• Report draft being revised.
2. R&D Management	• Assess management practices/needs in ASRT & NRC	• Report of NRC mgt. need survey presented at JCC XIV. NRC director reviewingrecommendations.
	• Recommend 1984-/86 (short term) R&D Mgt. Program for ASRT & NRC	• New ASRT President reviewing project reccommendations with joint ASRT/NRC R&D Mgt. Committee
	• Conduct long-range R&D Mgt program review for S&T sector and prepare operational plan	• In preparation, but ASRT S&T policy plan for long-range development must first be approved.
3. More and Better Food	• Design of MBF program within revised framework of more comprehensive rural development plan	• In process. Consultants Nichols and Henderson from Arizona were in Egypt to assist in the planning.
	• Continue training/ orientation and consultant activities	• Rittenbaugh (Arizona) assisted in data analysis steps;training, observation & study visits to USA being outlined for Summer 1985.

	• Planning for final report	• In process.
4. Biogas technology	• Orientation & study for two Egyptians from biogas team	• Completed July 1984
	• Plan and conduct international biogas users seminar (Nov. 1984)	• Completed Nov. 1984
	• Final meeting of U.S. Panel	• U.S. Panel participated in Cairo seminar and will assist with review of final report.
	• Planning final report	• In preparation.
5. Arid Zones/Land Reclamation	• Preparation of design plan for L.R. Project	• Plan presented to, & recommended by USAID/Cairo. Implementation in process.
	• Implementation of local training programs	• Local training needs under review.
6. Phosphate Ores	• Consultant visit start-up of wet acid phosphate conversion unit	• One-month consultant visit from IFDC completed in Dec. 1984.
	• Preparation of final summary report	• Consultant's report and final project summary report to JCC in preparation.
7. Wool Scouring	• Consultant for wool scouring line at Beda Dyers facility	• Deferred, probably not required.
	• Preparation of final summary report	• In process.
8. Corrosion	• Consultant for M&R training, ESCA surface science equipment	• Final visit by U.S. consultant completed in October 1984.

	• Consultant for R&D applications of surface science	
	• Final report	• Report of consultant received; project final report in process.
9. Red Sea Fisheries	• Training/study travel to USA	• Red Sea project has made no requirements for training, consultants, etc. Awaiting equipment.
	• Consultant, equipment operation and use	
	• Final Report	
10. Bentonite	• Training for up to 5 team members	• Training & study programs for 3 persons completed in Oct. 1984. One additional study/ observation visit to USA planned for Feb.-March 1985.
	• Visit of U.S. consultant panelist during contract period	• Visit of U.S. consultant planned early May 1985.
	• Final Report	• Report due late in calendar 1985.
11. Pharmaceutical	• Training, observation and study (5) persons in U.S. pharmaceutical facilities	• All observation/ study training to USA completed; one study visit to India proposed.
	• Consultant, pilot plant operations	• Deferred pending shipment of chemical intermediates.
	• Final Report	• To be completed late in 1985.

B. Comment on Liaison with Industry

Below is a preliminary summary of interactions between industrial end users and the individual projects in the Applied Science and

Technology Research Program. It is representative of activities which occurred and ties which are continuing as one benefit of the R&D activities.

1. More and Better Food *

- Ties established with Egyptian food industries, particularly with reference to the design for the Food Technology Pilot Plant at the National Research Centre.
- Direct ties established with vegetable oil processing companies, dairy industry (cheese making) and specialized high protein food producers (high nutrition weaning foods).

* Note: MBF also had several "clients" in addition to industry including farmer-producers, village cooperative associations, Ministry of Agriculture, Ministry of Health, Organization for the Development of Egyptian Villages, and families whose children participated in school feeding programs.

2. Biogas Technology *

- Ties established with the private sector poultry producers.

* Note: Biogas clients also included individual village households, village cooperative associations, Organization for the Development of Egyptian Villages, Ministry of Energy, etc.

3. Land Reclamation

Project just getting underway. Principal client is the Ministry of Reconstruction, Land Reclamation and New Communities. Results should be directly applicable to commercial (private sector) developers of new lands.

4. Phosphate Ores *

- National Research Centre group retained by Misr Phosphate Company to advise on beneficiation of Red Sea Phosphate deposits.
- Assist the Societe Financiere et Industrial d'Egypt (Kafr el-Zaiyat) in production quality control of its phosphate fertilizer operations.

* Note: Clients also include the Egyptian General Executive Organization for Industrial and Mining Complexes, a government agency within the Ministry of Industry, which was responsible for technical aspects of foreign sales contracts. On two occasions members of the phosphate R&D team traveled to the Peoples Republic of China to promote the sale of Egyptian ores from the Red Sea area deposits.

5. Wool Scouring

- The client was Misr Beida Dyers Company a public sector textile producer. The wool scouring/wool wax recovery unit was built on-site and tested full scale. Costs for equipment were shared by the project and the company. This R&D project led directly to a major change in the wool processing system.

6. Corrosion

- The client was Suez Oil Refining Company and the task was monitoring/reduction of corrosion in an operating refinery.
- The corrosion R&D group also demonstrated the feasibility of using corrosion inhibitors made from natural products in steam boilers for industrial process heat.

7. Red Sea Fisheries

No industrial clients.

8. Bentonite Clays.

- Industrial advisory committee for the project has been operating since 1982. Representation includes the General Petroleum Company, Sinai Manganese Company and El Hammrawein Oil Company.
- For foundry applications the client has been the iron and steel complex at Helwan.

9. Pharmaceuticals

- The industrial advisory committee has representation in each of the public sector companies:
  - -- Arab Company for Drug Industries and Medical Appliances (ACDIMA)
  - -- Chemical Industries Development Company (CID)
  - -- Kahira Pharmaceutical and Chemical Industries Company (Kahira)
  - -- Nasr Company for Pharmaceutical Chemicals (NASR)
  - -- Arab Drug Company (ADC)
  - -- Al Gomhouria Company for Drugs and Medical Supplies (Al Gomhouria)
- The principal cooperating group for pilot plant and production testing is the Nasr Company for Pharmaceutical Chemicals.

ANNEX A

SUMMARY REPORT
FOURTEENTH MEETING
JOINT CONSULTATIVE COMMITTEE
APPLIED SCIENCE AND TECHNOLOGY RESEARCH PROGRAM

CAIRO, EGYPT
OCTOBER 21-22, 1984
ACADEMY FOR SCIENTIFIC RESEARCH AND TECHNOLOGY
CAIRO, ARAB REPUBLIC OF EGYPT

BOARD ON SCIENCE AND TECHNOLOGY FOR INTERNATIONAL DEVELOPMENT
OFFICE OF INTERNATIONAL AFFAIRS
NATIONAL ACADEMY OF SCIENCES/NATIONAL RESEARCH COUNCIL
WASHINGTON, D.C. 20418, U.S.A.

Fourteenth Meeting, Joint Consultative Committee
Applied Science and Technology Research Program

Cairo, Egypt October 21-22, 1984

I INTRODUCTION

The fourteenth meeting, Joint Consultative Committee (JCC XIV) of the Applied Science and Technology Research Program sponsored by the Government of Egypt through the Academy of Scientific Research and Technology (ASRT) and the United States Agency for International Development (AID) was convened by its Chairman, Dr. Ibrahim Badran, ASRT President, on October 21, 1984, at the Academy headquarters in Cairo, Egypt.

Because Dr. Badran was scheduled to leave the Presidency of the ASRT by the end of October after more than four years of dedicated leadership, JCC members, both American and Egyptian, expressed their appreciation to him. He has been constant in his commitment and devotion to the goal of science and technology in the service of society. He introduced many innovations into the programs of the Academy and helped foster a greater public understanding of the important role of S&T for Egyptian development. As he left ASRT he was to return to his chair in medicine at Cairo University. His JCC colleagues expressed to him profound admiration and appreciation for his leadership in the program on Applied Science and Technology Research and in all other endeavors in which they were jointly engaged.

In a similar vein Dr. Leo S. Packer, Resident Director in Cairo for the NAS/NRC Program, was recognized for his services, dedication and friendship as he departed for France. His three short years in Egypt were described by Dr. Badran as an illustration of achievement

through good will and generosity of understanding. Dr. Packer was a problem solver, a catalyst in program planning and implementation, and a tireless teacher and friend to all scientists with whom he worked. He exemplified the highest spirit of cooperation and understanding and leaves Cairo with the best wishes of all JCC members and of his many friends in the scientific community in Egypt.

II RECOMMENDATIONS AND CONCLUSIONS

A. R&D Management Systems

The Joint Consultative Committee received both management and budget reports from Dr. A. S. El Nockrashy which summarized actions taken since JCC meeting XIII that are designed to reorient short and long term plans for the institutionalization of R&D management activities of the ASRT and the NRC. The actions were:

1. Creation of a high level Committee for the Development of R&D Management Systems by the President of the ASRT. This Committee, chaired by Dr. M. Kamel, NRC Director, and incorporating 10 additional members who have had specialized R&D management training and who presently carry management responsibilities in the ASRT and the NRC, is assessing the existing management systems of the two organizations, identifying needs, establishing working plans and suggesting inputs from the Applied Science and Technology Research Project.

2. Preparation of a draft discussion paper for an action program by Dr. A.A.Abdul Azim, Director, Central Metallurgical Research and Development Institute and member of the Committee. The discussion paper suggests a course of action for the ASRT and separately for NRC

with common elements of staff training within an overall approach of institutional management directed toward problem solving for user communities and clients in Egypt.

3. Realization of a NRC staff seminar led by Dr. Ibrahim El-Ghamry, Dean, National Institute of Higher Management on the organizational development of the National Research Centre. This activity was highly analytical and in a positive manner sketched directions for strengthening technical, managerial and support systems of the Centre.

Taking into consideration the activities outlined above, the JCC:

- Commended Dr. Badran for the creation of the Committee for the Development of R&D Management Systems and its delegation of responsibility for the design of operational short-term and long-term programs.
- Thanked Dr. Kamel for the work that has been initiated, especially as it relates to the NRC.
- Urged that the training elements in R&D project management and the R&D marketing activity based upon the NRC model be implemented immediately so that the 1984-1986 goals can be achieved. In particular, a definite plan of action for 1985 is needed.
- Requested that the process initiated in the NRC staff seminar led by Dr. Ibrahim El-Ghamry be continued so that a long term R&D management systems development plan may be completed in 1985.

- Encouraged the ASRT to accelerate its planning efforts incorporating appropriate suggestions from Dr.Abdul Azim's discussion paper and utilizing as may be appropriate the services of Dr. El-Ghamry.
- Requested the JCC Executive Committe of Drs. Hassan Ismail and Gilbert White to review progress of the work by February 1, 1985.
- Asked that a full report on R&D Management activities be presented at JCC XV.

Dr. Badran asked that the JCC XIV report state that training in R&D management which has already been given has had an impact upon the ASRT and the follow-up it has achieved in its activities.

B. S&T Policy Measures

With the guidance of JCC member Dr. I. H. Abdel Rahman and ASRT Vice President Dr. M. B. E. Fayez, the JCC reviewed the current status of S&T policy planning undertaken during Phase II of the Applied Science and Technology Research Program.

Dr. Abdel Rahman highlighted the continuing efforts in the sectoral or interactive approach which he has helped to guide as Chairman of the ASRT Committee on Science and Technology Policy. During 1983 there have been two meetings of R&D user-groups with the corresponding R&D generator-groups from within the Ministry of Agriculture and the Ministry of Industry, and in 1984 one each within the Ministries of Agriculture, Construction, Petroleum, and Electricity and Power. Later in October 1984 there is scheduled a

meeting within the Ministry of Irrigation. The process is a continuing one in each of these named ministries as well as in other development sectors with the Minister himself playing a leading role.

Dr. Mohamed Fayez reported on plans for a second phase of studies under the general umbrella of the technology policy planning group which has been coordinated from within the ASRT. Suggested examples were given:

1. For future studies to enhance the interaction between national R&D and production establishments in strengthening Egyptian national S&T infrastructure, institutional development, and technology transfer through an enhanced national capability to "unpackage" technologies offered from abroad.

2. For the promotion of overall technological development by means of greater popularization and understanding of S&T in Egypt, creation of "centres of excellence," leader-sector technologies and additional guidance on levels of technologies to be acquired.

The JCC commended the continuing actions which are underway under the general guidance of the ASRT Committee on Science and Technology Policy and particularly the efforts within the Ministries themselves that are self-sustaining and continue within a coordinated but independent framework.

Activities in the S&T Policy Program, especially the seminars and the interactive meetings, will be reviewed in order to reach a synthesis about past experiences and future plans and in order to propose an appropriate arrangement for their institutionalization.

A two-day closed meeting for exchange of views and "brain-storming" will be held in Washington immediately before the next session of the JCC. The meeting will be attended by the members of the JCC, its past presidents and a few selected participants, all in their individual capacities. The purpose of the two-day meeting will be to discuss prospects and forms (mechanisms) for USA-Egypt cooperation in S&T.

In preparation for the above activities, a selection of documents, especially evaluation and assessment reports and tests of relevant cooperation programs between the two countries, will be circulated to the participants. A number of background and of analytical documents will be prepared some of which require the appointment of consultants and will entail travel costs.

An itemized budget for the project will be prepared before mid-November 1984 with details to be prepared later. An executive committee of JCC composed of Professor Karl Willenbrock and Dr. Ibrahim H. Abdel Rahman will be responsible for planning and implementation of those activities.

C. More and Better Food

The JCC received a progress report on the More and Better Food demonstration project as well as a comprehensive planning document clearly outlining four major elements for priority actions during the final months of Phase 11.

Specific plans can be categorized:

1. At the village level, which is directed toward problem solving not only for greater plant and animal productivity but also the improvement of nutrition and child health and the enhancement of the role of women in overall economic productivity of the family,

2. At the governorate level, which is a mechanism to extend the benefits and lessons learned from the five demonstration villages,

3. At the national level, which stresses the interaction between the MBF and the appropriate Ministries,

4. At the level of institutionalization of support systems development with particular reference to the NRC.

The JCC commended the MBF group and the NRC for its planning activities and continuing action program. The JCC also noted the assistance given by a group from the University of Arizona which reinforces the elements of analysis, follow-up, and evaluation as an integral part of the ongoing program. At the same time the JCC stressed:

- That the problems of rural communities are social as well as economic. This recognition should always guide those responsible for MBF implementation as the project moves toward a more comprehensive stage of development for rural societies.
- That the private sector must be motivated and stimulated to participate to a greater degree in rural development at the village and governorate levels. Local banks which often have development funds should be encouraged to invest in projects which MBF has demonstrated to be productive and feasible.

- That stronger ties should be formed between the MBF project and the ASRT regional development centers which are currently being inaugurated. Both MBF and the regional centers will profit from such partnership and cooperation.

D. Land Reclamation

The JCC reviewed a report submitted by Dr. Hassan Wahby, Director, Water Management Research Institute, Ministry of Irrigation, which outlined the principal features of a research and development effort already supported under the 5 Year R&D plan of the ASRT. The R&D program covers technical and socio-economic evaluation of irrigation systems in the new lands and their impact on crop production, land tenure, soil properties, irrigation efficiencies, energy needs, environmental effects and water requirements. By adding modest resources which can be made available from the Applied Science and Technology Research Program, the project will be more able to provide Egypt with urgently needed data on, both technical and socio-economic aspects of major desert soil types and analyses for:

- Evaluation of surface, sprinkler, drip and furrow irrigation in terms of systems operation, maintenance, efficiency and energy requirements,
- Evaluation of soil-water management relationships, and an
- Evaluation of socio-economic impacts of different irrigation methods under the prevailing land tenure systems in Egypt.

The JCC expressed appreciation for the role of Dr. Hassan Wahby in bringing the plan to its clear stage of preparation. Appreciation was also given to Drs. M. El-Gabaly, Hassan Ismail and Gilbert White for their encouragement and guidance.

The JCC recognized that the magnitude of the task to be undertaken by the group under Dr. Hassan Wahby appears ambitious.

To help assure that preliminary results are forthcoming within the two years available, JCC recognized that continuing oversight by the project Supervising Committee and by full time resident scientists in each location is needed.

The JCC urged prompt action on the part of all parties to assure that final approvals are obtained from AID and ASRT, that equipment is clearly specified so that procurement may be expedited, and that other inputs and outputs be specifically categorized and scheduled.

The JCC suggested that its Executive Committee of Drs. Ismail and White review the progress of the Land Reclamation activity by February 1, 1985.

E. Program Plan and Budget Reallocations

Review, analysis and fine tuning of the Applied Science and Technology Research Program budget and implementation plan is a continuing activity of the program staff recognized both by the AID sponsor and by the ASRT as a necessary element of the final stages of the overall program. The JCC Executive Committee has exercised its oversight of this process and should continue to do so.

The JCC has previously acknowledged that the R&D projects on Phosphate Ores, Corrosion in Petroleum Refining and Wool Scouring are completed. With an International Biogas Users Conference scheduled for November 17-24, 1984, the Biogas Technologyy project will also reach its logical conclusion. The JCC will receive a final report from the Biogas Technology project at its next meeting.

The S&T Policy Measures Project will continue to receive oversight from the JCC as may be requested by the ASRT president and following recommendations received through the JCC Executive Committee.

The Bentonites and Red Sea Fisheries projects are scheduled for completion by September 1985. The Pharmaceutical Chemicals project is dependent upon receipt of the full inventory of chemicals now on order. Its scheduled completion at the pilot plant and test production scale must therefore be allowed to proceed when delivery of the chemicals permits a better time estimate for completion of the project.

The elements which require immediate staff review of their budgetary aspects are:

- More and Better Food
- Land Reclamation
- R&D Management
- Continuance of JCC function
- S&T Policy Measures

It is understood that the NAS/NRC must submit a proposal to AID by mid-November 1984 if a program extension after January 31, 1985 is to achieved without interruption of NAS/NRC activities in Egypt.

The JCC urged that the orderly process of budgetary review and reallocation be continued and that a report be submitted first to the Executive Committee and to the full JCC at its next meeting.

F. Science and Technology Information (STI)

The JCC noted that the STI Project Executive Committee is currently undertaking two policy-level activities that are of particular interest. They are:

- Information Awareness: The objective of this nationwide activity is to raise the perception of Egyptian decision makers concerning the value of data and information as a problem solving resource. It is well known that the perception of the value of information is a prerequisite to development of markets for information technology.

One general step which the STI Project Executive Commiitee is taking on this issue is the organization of a Task Group composed of representative senior Egyptian information, informatics, communication and mass media experts to educate, illustrate and market information as a necessary tool for the public and private sector.

- Governance: A second activity of the STI Project Executive Committee is directed toward the formulation and eventual establishment of an Egyptian management or governance groups for the STI Network. The governance groups should be given broad responsibility for effective policy-making, planning, development, performance monitoring and financial support for the Egyptian National STI Network. The question of adequate staffing of the governance agency, including the continuation of the technical support group, should be addressed.

It is presently estimated that the governance group or agency and the awareness program will require support for a period of approximately 5 years after the end of the present STI Project in September 1986.

- Incentives: The JCC stressed the need for incentives from the ASRT for the nodes working groups in order to reinforce performance and achievement.

- Evaluation: The JCC recognized the advisability for a process evaluation of the STI project prior to the JCC XV meeting in the spring of 1985.

G. Standards and Measures:

The JCC received a report from the Standards and Measures subproject whose activities are centered in the National Institute of Standards (NIS, affiliated with ASRT), the Egyptian Organization for Standardization and Quality Control (EOS, Ministry of Industry) and Assay and Weights Administration (Ministry of Industry). The U.S. counterpart is the National Bureau of Standards (NBS).

A review of the equipment procurement component for the subproject revealed the following:

Status of Equipment Procurement/Shipment/Installation

October 1, 1984

Total Value of Equipment Budget $727,500

(Data from University of Wisconsin Contractor)

		Percent of total	
1.	Equipment requested from Egypt as percentage of budget		100%
2.	Equipment orders completed by USA Contractor		100%
3.	Equipment not delivered to USA Contractor	15.4%	
4.	Equipment in process of shipment	9.6%	
5.	Equipment in customs (Egypt)	23.2%	
6.	Equipment received but not installed*	42.9%	
7.	Equipment installed (Egypt)	8.9%	
	Total		100%

*Note: The major item received in Egypt but not installed is an x-ray florescence machine for EOS which requires re-establishing power at the site and installation of water cooling. These facilities are currently in process of being provided according to the design specifications and should be available in 1985.

Because equipment installation delays have in turn set back training schedules, the completion of training is being re-programmed. Completion of English language training has also delayed the technical training programs. An extension of the NBS participating agency service agreement from April through September 1985 is required and has been officially requested.

Plans for the final two scheduled workshops in Building Technology and in Fire Research are also being completed. These workshops are to be held before September 1985.

The JCC also noted that the Standards and Measures activities cannot be considered fully institutionalized when the present Applied Science and Technology Research Program is completed in September 1985. NIS and EOS will have continuing needs for technical exchanges, standards information, and other forms of linkages with U.S. standards institutions in the private sector and with the National Bureau of Standards.

H. Instrumentation Technology/Scientific Equipment Maintenance:

Project leaders from the Scientific Instrument Centre (SIC) and the National Institutes of Health (NIH) reported that Phase I and Phase II have resulted in:

- Establishment of a national instrumentation repair and training capacity at SIC which can serve Egyptian universities and research institutes on a fee for service basis.

- Establishment of repair and maintenance centres at five Egyptian universities and the NRC during Phase I and at three additional universities during Phase II (Zagazig, Menoufia and Suez Canal universities).

The goal during the final year of Phase II is to complete the activities already undertaken and take necessary steps to assure the ability of the centres to grow and to meet Egypt's changing needs for instrumentation repair and maintenance. Among the activities which are currently being emphasized are:

- Identifying local (in Egypt) sources for replacement components which can be reliably utilized by the university R&M centres and the SIC Instrumentation Technology Unit.
- Developing and modifying the training unit at SIC so that it will have a more nearly assured supply of "trainers-of-trainers" and will be able to adapt to the real needs of the other centres.
- Developing stronger links among the SIC, NRC and university R&M centres so that manpower and other specialized resources may be pooled and thereby better serve all instrumentation repair needs in Egyptian R&D institutions.
- Identifying suitable Egyptian sources for training in the repair and maintenance of specialized equipment.

I. Instrumentation Technology and Equipment Management:

Although it was not possible for the U.S. representative from the contractor, the University of Wisconsin Instrumentation Systems Centre (U.Wis.), to be present at JCC XIV, a report was made by the local representative in Cairo who is responsible for receiving equipment procured from the USA, assisting ASRT and NRC in customs formalities, and arranging delivery to the labs when readiness to receive the equipment has been assured.

Because the closing date for the U.Wis. contract is September 1985, remaining equipment items which are principally for the Land Reclamation project (formerly New Crops for Arid Zones) must be fully specified before the end of November 1985.

The JCC asked that:

- Land Reclamation project equipment orders (Budgeted for $100,000) be specified as expeditiously as possible and within the period requested by the University of Wisconsin.
- An inquiry be made to the U.Wis. concerning the status of the Red Sea Fisheries equipment order. If source and origin waiver requirements for the specified equipment will extend delivery times, means should be explored to complete the analytical work by contract at other laboratories inside or outside Egypt.
- Efforts be made to expedite the delivery and clearance of all bulk chemicals for the pharmaceutical chemicals R&D project so that the pilot plant and production scale test runs may be scheduled as soon as possible.

J. Other Projects:

Principal investigators for the Biogas Technology, Red Sea Fisheries, Bentonite and Pharmaceutical Chemicals projects reported to the JCC.

- The JCC noted that the Biogas users conference scheduled for November 17-24, 1984, is to be held as planned in Cairo with gratifying support from nonproject sources which was arranged by the principal investigator, Dr. M. M. El-Halwagi. This support will assure participation from at least 15 developing countries; remaining project funds have been budgeted for key participants from the United Siates (including the advisory panel), Great Britain and Switzerland, and for a first quality final report of the conference proceedings. A Biogas Technology project final report is to be available to JCC at its next meeting.
- The Bentonite project is proceeding essentially on schedule. It will result in a greatly strengthened capacity within Egypt for the analysis of clay mineral materials as related to commercial development. One deposit along the Cairo Alexandria road has been shown to be far more extensive and of higher industrial use potential than originally anticipated. It could well become the focus of intensive commercial development within the coming 3-5 years.

The Pharmaceutical Chemicals project has completed its bench scale activities and U.S.A. training programs in pilot plant operations. The next step, that of scale-up to pilot plant and production scale facilities, awaits delivery of bulk chemicals from the U.S.A.

K. Date and Site for the Next JCC Meeting:

The JCC members chose Washington, D.C. as the site for JCC XV on April 1-3, 1985. The meeting will be preceded on March 30-31, 1985, with a workshop on S&T cooperation between Egypt and the United States (lessons learned and implications for future activities).

AGENDA

Fourteenth 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)

Cairo, Egypt — October 21-22, 1984

Sunday, October 21, 1984
Council Room, ASRT Building
101 Kasr El Aini Street

MORNING SESSION

9:30 a.m.	Welcome	Ibrahim Badran Chairman, JCC
	Response	Karl Willenbrock U.S. Panel, JCC
		John Hurley, Director Board on Science and Technology for International Development, NAS/NRC
	Remarks	Arthur Handley Deputy Director USAID/Cairo
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, ASRT
10:45 a.m.	NAS/NRC Report	Leo Packer NAS/NRC Resident Program Director in Cairo
11:00 a.m.	Break for Coffee	
11:15 a.m.	Proposed Program Plan and Budget Reallocation	A. S. El Nockrashy
11:45 a.m.	Technology Policy	I. H. Abdel Rahman Member, JCC

		M. B. F. Fayez Advisor, JCC S&T Policy Project
12:30 p.m.	Luncheon	

AFTERNOON SESSION

2:00 p.m.	More and Better Food Program Reorientation	O. Galal Program Coordinator
3:00 p.m.	Land Reclamation	H. Wahby, Director Water Management Research Institute Ministry of Irrigation
4:00 p.m.	Adjourn	

Monday, October 22, 1984

MORNING SESSION

9:30 a.m.	Biogas	M. M. El Halwagy NRC
9:50 a.m.	Bentonite	A. A. Abdel Azim CMRDI
10:10 a.m.	Pharmaceuticals	M. B. E. Fayez NRC
10:30 a.m.	Fisheries	M. Ehab Bebars IOF
11:00 a.m.	Break for coffee	
11:15 a.m.	Instrumentation Technology	M. Shaltoot Scientific Institute Centre F. Rageb University of Wisconsin
11:45 a.m.	Standards and Measurements	A. Dawoud, Director National Institute of Standards K. Heinrich U.S. National Bureau of Standards
12:30 p.m.	Working lunch	

AFTERNOON SESSION

2:00 p.m.	Scientific and Technical Information Systems	M. Hallouda, Director CAPMAS M. Abdel-Basset Georgia Tech. V. Slamecka Georgia Tech.

2:30 p.m. Concluding Session

- Recommendations and Conclusions
- Program Plan and Budget
- R&D Management
- S&T Policy Measures
- More and Better Food
- Land Reclamation
- S&T Information
- Other Elements
- Date and site for next JCC Meeting

4:00 p.m. Adjourn

List of Participants, Invited Guests, and Observers

Fourteenth Meeting
Joint Consultative Committee
Applied Science and Technology Research Program

Cairo, Egypt October 21-22, 1984

Egyptian JCC Members

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

Dr. Abdel Aziz Hegazy
Counselor, ASRT

Dr. Hassan Ismail
Counselor, ASRT

Dr. Mostafa El Gabaly
Counselor, Minister of Agriculture

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

Dr. Ibrahim H. Abdel Rahman
Counselor, Office of the Prime Minister

U.S. JCC Members

Dr. Karl Willenbrock, Chairman ad interim, U.S. Panel
School of Engineering and Applied Science
Southern Methodist University

Dr. Lowell Lewis
Assistant Vice President for Agriculture and Natural Resources, and
Director of the Agricultural Experiment Station
University of California

Dr. James Hillier
International Consultant (former member and special consultant to (JCC)

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. M. B. E. Fayez
Vice President, ASRT

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

Dr. Osman Galal, Head
Child Health Laboratory, NRC/Cairo, and
Director National Institute of Nutrition

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

Egyptian Principal Investigators and Program Monitors

Dr. Adel Abdel Azim, Director
Central Metallurgical Research and Development Institute
Principal Investigator, Bentonite Clay Project

Dr. Abdel Fattah Dawoud, Director
National Institute for Standards

Dr. Fouad Sobhy, Director
Organization for Standardization and Quality Control

Dr. M. El Halwagi, Head
Pilot Plant Laboratory, NRC/Cairo
Principal Investigator, Biogas Technology Project

Dr. Hassan Wahby, Director
Egypt Water Use and Management Project, and
Principal Investigator, Land Reclamation Project

Dr. M. Ehab Bebars
Co-Principal Investigator, Red Sea Fisheries Project.

Eng. M. Shaltoot
Instrumentation Project Director, ASRT

Eng. Fouad Ragheb
Manager of Procurement ITU

Mr. Ahmed Abdel Basset
Information Systems Technology Project Director, ASRT

Dr. M. H. Fadl
Program Monitor, Science and Technology, ASRT

Dr. Dia Hassanien Ali
Program Monitor, Science and Technology, ASRT

Dr. Hatem Mohamed Ali
Program Monitor, Science and Technology, ASRT

Dr. Mahfouz Kassem
Supervisor, MBF Testing Laboratory, NRC/Cairo

Agency for International Development

Mr. Arthur Handley, Deputy Director
USAID Mission in Cairo

Dr. Bernard Wilder, Associate Director
Human Resources Development Cooperation
USAID Mission in Cairo

Mr. Lawrance Ervin, Director
Science and Technology Division
USAID Mission in Cairo

Dr. Jack Monagle
Office of Science and Technology
USAID Mission in Cairo

National Academy of Sciences

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

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

National Bureau of Standards

Dr. Kurt Heinrich, Chief
Officer of International Relations

National Institute of Health

Mr. Howard Metz, Head
Biomedical Engineering and Instrumentation Branch

Georgia Institute of Technology

Dr. Vladimir Slamecka
School of Information and Computer Science

Special Observers

Dr. Harold Freeman, Chief
Human Resources and Science and Technology Division
Office of Technical Support
Bureau for Near East

Mr. Bert Porter
Assistant Egypt Desk Officer
Office of Egypt Affairs
Bureau for Near East

Dr. Dana P. Younger
Office of Technical Support
Bureau for Near East

ANNEX B
TRAVEL TO EGYPT
October 1 - December 31, 1984

NAME	DATE	PURPOSE
PROGRAM MANAGEMENT		
1. Michael S. Biela Assistant Comptroller, NAS/NRC	Oct. 25-Nov. 2	Financial review, Phase II Egyptian pound (LE) account
2. Jay Davenport Staff Officer, BOSTID	Oct. 13-Nov. 20	Program planning & management, JCC-XIV
3. Lowell Lewis JCC member	Oct. 18-24	JCC-XIV
4. Karl Willenbrock JCC member	Oct. 18-24	JCC-XIV
5. James Hillier JCC Advisor	Oct. 18-24	JCC-XIV
6. John Hurley Director, BOSTID	Oct. 20-24	JCC-XIV
7. Maryalice Risdon Staff Associate, BOSTID	Nov. 13-28	Program management, International Biogas Conference
DEVELOPMENT AND APPLICATION OF BIOGAS TECHNOLOGY IN RURAL AREAS OF EGYPT		
8. Philip Goodrich Dept. of Agricultural Engineering, University of Minnesota	Nov. 16-25	International Conference on Biogas Technology Transfer and Diffusion, Cairo, Nov. 17-24
9. Harold Capener Dept. of Rural Sociology Cornell University	Nov. 16-24	Int'l Conf. on Biogas, Nov. 17-24
10. T.B.S. Prakasam Metropolitan Sanitary District of Greater Chicago	Nov. 16-24	Int'l Conf. on Biogas, Nov. 17-24
MORE AND BETTER FOOD		
11. Cheryl Ritenbaugh Dept. of Family & Community Medicine, Univ. of Arizona	20 days during Nov.	Data analysis and evaluation of nutritional impacts of agricultural innovations
12. Andrew W. Nichols Dept. of Family & Community Medicine, Univ. of Arizona	Dec. 6-15	Review of health/nutrition/sanitation program activities
13. Helen K. Henderson Dept. of Family & Community Medicine, Univ. of Arizona	Dec. 24-Jan. 20	Study role of women in project activities to determine relation of gender to access to and control of project resources & benefits

EVALUATION OF EGYPTIAN PHOSPHATE ORES FOR PHOSPHATE FERTILIZER PRODUCTION

14. Irwan T. Rusli International Fertilizer Development Center	Nov. 19-Dec. 19	Start-up and test runs on bench-scale wet-process phosphoric acid (BSWPA) unit, training of personnel in operational procedures & techniques, data analyses and evaluation of test results

CORROSION CAUSES AND CONTROL

15. M. Tom Thomas Battelle Pacific Northwest Laboratories	Oct. 3-31	Conduct a training program in preventative maintenance, repair, and calibration of ESCA/AES system; present three seminars on the applications of surface science to corrosion problems