

No. 17483

**UNITED STATES OF AMERICA
and
SAUDI ARABIA**

Project Agreement for technical co-operation in science and technology (with memorandums of understanding dated 30 June 1975, attachments and appendices). Signed at Riyadh on 29 February 1976

Authentic text: English.

Registered by the United States of America on 22 January 1979.

**ÉTATS-UNIS D'AMÉRIQUE
et
ARABIE SAOUDITE**

Accord de projet relatif à la coopération technique dans les domaines scientifique et technologique (avec mémorandums d'accord en date du 30 juin 1975, pièces jointes et appendices). Signé à Riyad le 29 février 1976

Texte authentique : anglais.

Enregistré par les États-Unis d'Amérique le 22 janvier 1979.

PROJECT AGREEMENT¹ BETWEEN THE GOVERNMENT OF THE KINGDOM OF SAUDI ARABIA AND THE NATIONAL SCIENCE FOUNDATION AND THE DEPARTMENT OF THE TREASURY, GOVERNMENT OF THE UNITED STATES OF AMERICA, FOR TECHNICAL COOPERATION IN SCIENCE AND TECHNOLOGY

Article I. SCOPE

This Project Agreement between the Government of the Kingdom of Saudi Arabia and the National Science Foundation and the Department of the Treasury of the Government of the United States (hereinafter referred to as NSF and Treasury, respectively) sets forth arrangements for the conduct of a technical cooperation project (hereinafter referred to as the Project) to enhance the Saudi Arabian scientific and technological capabilities necessary for its economic and social development. The Project will assist Saudi Arabia in the development of its science capabilities in a phased and flexible manner which will take into account the Kingdom's existing scientific infrastructure and the unique scientific and technological challenges associated with national development.

This Agreement involves the gradual implementation of the suggestions contained in the *ad referendum* memoranda of understanding (Appendix A) signed by representatives of the United States and Saudi Arabian Working Group for Science and Technology dated June 30, 1975, and supersedes those memoranda.

Attached to this Agreement are also appendices dealing with specific activities to be conducted under this Agreement. The appendices provide additional substantive detail, anticipated staff requirements and estimated costs. Work plans providing more details on proposed activities will be developed, as required during the term of this Agreement, by NSF and the Saudi Arabian National Center for Science and Technology (hereinafter referred to as SANCST), a research center to be established by the Saudi Arabian Government.

The parties shall consult from time to time with a view towards developing additional activities.

Article II. AUTHORIZATION

This Project will be carried out under the auspices of the United States–Saudi Arabian Joint Commission on Economic Cooperation and in accordance with the provisions of the Technical Cooperation Agreement between the Governments of the United States and the Kingdom of Saudi Arabia signed February 13, 1975,² which is hereby incorporated by reference and becomes a part of this Agreement.

Article III. PURPOSE AND OBJECTIVES

The purpose of this Agreement is to assist Saudi Arabia to implement the foreseeable objectives of SANCST as outlined in the memoranda of understanding dated June 30, 1975.

¹ Came into force on 7 August 1978 by signature by representatives of the Parties and after the deposit by the Government of Saudi Arabia of the sums described in appendices B through E for the first calendar year of the Agreement, in accordance with article XVI.

² United Nations, *Treaty Series*, vol. 998, p. 209.

The Project will contribute to the attainment of these objectives through various agreed subprojects, hereinafter referred to as tasks, and through the establishment of an NSF/SANCST Program Office. Articles V-VII below describe three tasks to be undertaken at the earliest possible date in an appropriately phased manner. Additional tasks will be undertaken as mutually agreed by SANCST, the Saudi Arabian Ministry of Finance and National Economy (hereinafter referred to as "MFNE"), NSF, and Treasury in amendments to this Agreement. Article IV describes the NSF/SANCST Program Office.

Article IV. NSF/SANCST PROGRAM OFFICE

NSF will establish an NSF/SANCST Program Office to support the activities pursuant to this Agreement. This Program Office will be staffed in accordance with the developing needs of the Project and in close consultation with SANCST. This Office will be responsible for coordination of all U.S. activities pursuant to this Agreement, including oversight of implementation and evaluation of the Project's overall progress. Further details on the NSF/SANCST Program Office and estimated costs are contained in Appendix B.

Article V. TASK I: SCIENTIFIC RESOURCES INVENTORY AND ANALYSIS

NSF will assist SANCST in preparing an inventory and analysis of Saudi Arabia's scientific and technological human and physical resources.

Further detail and estimated costs for this task are provided in Appendix C.

Article VI. TASK II: IMPLEMENTATION OF COLLABORATIVE PROJECTS

NSF, in conjunction with SANCST, will assist in the design and, as agreed upon, oversee collaborative projects between SANCST and U.S. institutions, recognizing the provisions of Article VIII below.

Further details and estimated costs for this task are provided in Appendix D.

Article VII. TASK III: INSTITUTIONAL DEVELOPMENT OF SANCST

Task III will provide for the development of the SANCST research, educational, and administrative framework.

Further details and estimated costs for this task will be provided in Appendix E.

Article VIII. DEVELOPING U.S./SANCST LINKAGES

NSF will provide advice and assistance to SANCST in developing agreed upon scientific and technological linkages between SANCST and other U.S. Government agencies. In addition, NSF will provide advice and assistance to SANCST in developing scientific linkages and cooperative agreements between SANCST and the U.S. private sector and academic community. After mutual consultation and agreement, these linkages and agreements may be made directly by SANCST or through appropriate U.S. Government agencies on behalf of SANCST. In the event that there is need for contracting for services, supplies and equipment to be furnished by private sector institutions, separate arrangements will be made. It is contemplated that these linkages and agreements will make an important contribution to assuring the successful development of SANCST.

Article IX. REPORTS

NSF, in collaboration with Treasury, will prepare and transmit to SANCST and MFNE a semi-annual report covering the over-all status and progress of this Project.

Article X. COORDINATION

Over-all coordination of this Joint Economic Commission Project with other Joint Economic Commission activities within the United States Government and provision of certain administrative facilities and support for this Project will be the responsibility of Treasury. The Office of the Joint Economic Commission in Riyadh will serve as the point of contact for procedural and policy-related communications between SANCST, MFNE, NSF, and Treasury concerning the relationship of the Project to the Joint Economic Commission Program, will facilitate activities under this Agreement and will follow the implementation of this Agreement in Saudi Arabia. The NSF project officer assigned to the Joint Economic Commission in Riyadh will be the point of contact for planning and implementation activities under the Project.

Article XI. LOCAL SUPPORT

SANCST shall directly or through other Saudi Arabian agencies provide all necessary support to insure the achievement of the purposes of this Agreement.

Article XII. CONFIDENTIALITY OF INFORMATION

To the extent permitted by U.S. law, NSF and Treasury will, upon request of SANCST, keep confidential any information or data provided to them by SANCST or generated as a result of the activities of SANCST pursuant to this Agreement.

Article XIII. PATENTS

With regard to the disposition of patent rights to inventions arising from any work, regardless of its nature and immediate and/or future application, performed by NSF and Treasury under this Agreement:

- A. The Saudi Arabian Government shall acquire title to any such invention regardless of where the invention is made;
- B. The Saudi Arabian Government shall have the right to file a patent application in any foreign country on such invention and acquire title thereto;
- C. The United States Government shall receive a royalty-free, non-exclusive, irrevocable license to practice any such invention with the right to issue sub-licenses in the United States.

Article XIV. "FORCE MAJEURE"

The term *force majeure* means acts of God, acts of a public enemy, war, civil disturbances, and other similar events not caused by nor within the control of the parties.

If any party to this Agreement is rendered unable because of *force majeure* to perform its responsibilities under this Agreement, these responsibilities shall be suspended during the period of continuance of such inability. During the period of suspension of performance caused by *force majeure*, NSF and Treasury may continue to pay normal costs of maintaining Project personnel from funds advanced to the United States by the Government of Saudi Arabia. In the event of suspension of a party's duties because of *force majeure*, the parties shall consult and endeavor jointly to resolve any attendant difficulties.

Article XV. FUNDING

The Government of Saudi Arabia agrees to deposit in the Dollar Trust Account in the United States Treasury established by the Technical Cooperation Agreement sums sufficient to cover in advance the estimated costs of this Project. The costs for the services to be provided by and through NSF and Treasury for the initial period of the Project, covering one calendar year, are outlined in Appendices B-E. Budgets for subsequent

periods of this Project will be prepared and submitted by NSF and Treasury for acceptance by the Government of Saudi Arabia in accordance with the budget schedule of the Government of Saudi Arabia during the life of this Agreement. The Government of Saudi Arabia will authorize dispersal of required funds from the Dollar Trust Account for this Project pursuant to the Technical Cooperation Agreement.

Article XVI. EFFECTIVE DATE AND DURATION

This Agreement shall become effective after signature by representatives of the parties, organization of SANCST and the deposit by the Government of Saudi Arabia of the sums described in Appendices B-E for the first calendar year of the Agreement. This Agreement shall remain in effect until terminated by any party hereto in accordance with Article XVII below, or termination of the Technical Cooperation Agreement of February 13, 1975, whichever shall occur first.

Article XVII. AMENDMENT, EXTENSION, OR TERMINATION

- A. This Agreement may be amended or extended by mutual agreement in writing.
B. This Agreement may be terminated by any party notifying the others 90 days in advance in writing.

Article XVIII. RESOLUTION OF DIFFICULTIES

NSF, Treasury, SANCST, AND MFNE shall consult, upon request of them, regarding any matter relating to the terms of this Agreement and shall endeavor jointly in a spirit of cooperation and mutual trust to resolve any difficulties or misunderstandings that may arise.

Government of the Kingdom of Saudi Arabia:

[Signed — Signé]¹
Date: February 29, 1976

National Science Foundation:

[Signed]
JOHN V. GRANGER
Date: February 29, 1976

Department of the Treasury:

[Signed]
WILLIAM E. SIMON
Date: February 29, 1976

¹ Signed by Mohammad Aba al-Khail — Signé par Mohammad Aba al-Khail.

[APPENDIX A]

MEMORANDUM OF UNDERSTANDING ON RECOMMENDATIONS FOR THE ESTABLISHMENT OF THE
SAUDI ARABIAN NATIONAL CENTER FOR SCIENCE AND TECHNOLOGYI. *Background*

On June 8th, 1974, HRH Prince Fahd Ibn Abd al-Aziz, then second Deputy Prime Minister and Minister of the Interior of Saudi Arabia, and Secretary of State Henry Kissinger signed in Washington, D.C., a joint statement which established the U.S.—Saudi Arabian Joint Commission on Economic Cooperation.¹ This Joint Commission is co-chaired by the United States Secretary of the Treasury and the Saudi Arabian Minister of State for Finance and National Economy.

Under the Joint Commission, a Joint Working Group on Science and Technology was established in order to develop a program of cooperation between the United States and Saudi Arabia in the area of science and technology.

Initial program recommendations from the Joint Working Group on Science and Technology were developed following a meeting in Riyadh, Saudi Arabia, on September 16 and 17, 1974. Following further exchanges between Joint Working Group members, a team of six specialists from the U.S. National Science Foundation and Department of the Treasury traveled to Saudi Arabia to survey the existing base for further development in science and technology. The team visited Saudi Arabia from May 3 to May 18, 1975. Team members visited the three existing universities in Saudi Arabia, held discussions with a number of government officials concerned with academic and industrial scientific research, and visited several scientific and technical institutions. The information developed during that visit has provided the basis for a refinement of the initial Joint Working Group program recommendations for the establishment of a Saudi Arabian National Center for Science and Technology (SANCST). On June 28, 29, and 30, a U.S. Delegation met in Riyadh with the Saudi Arabian Working Group on Science and Technology and mutually agreed upon the substance of these recommendations.

II. *Objectives*

The United States—Saudi Arabian Joint Working Group on Science and Technology herewith presents a recommendation for the establishment of a Saudi Arabian National Center for Science and Technology (SANCST).

The Saudi Arabian National Center for Science and Technology would have the following objectives:

- Formulate and implement science and technology policies, taking into account Saudi Arabian national social and economic goals;
- Develop Saudi Arabian research capabilities, facilities, and the necessary infrastructure;
- Undertake and support specific research programs in areas important to Saudi Arabian social and economic development objectives;
- Organize and support joint international-Saudi Arabian research programs;
- Create and manage a system of national research laboratories to focus on applied research of unique interest and need to Saudi Arabia;
- Support existing Saudi Arabian educational and training institutions in their efforts to increase the numbers of scientifically and technically trained people in Saudi Arabia;
- Establish and maintain a scientific and technical manpower information system, as an aid to science planning and the effective use of scientific and technical personnel;

¹ United Nations, *Treaty Series*, vol. 979, p. 273.

- Organize, operate or sponsor effective science information institutions and activities, including international conferences, symposia, and research publications, that will be useful in achieving the objectives of the SANCST;
- Cooperate with universities, laboratories, and other research centers to encourage research, exchange knowledge and experience, and avoid duplication of effort.

III. *General description of the Saudi Arabian National Center for Science and Technology*

The Joint Working Group on Science and Technology proposes a broad cooperative program in science and technology directed toward the social and economic development of Saudi Arabia.

A fundamental step is the creation and development of a major new organization in Saudi Arabia, the Saudi Arabian National Center for Science and Technology (SANCST). This organization will formulate and implement science and technology policies consistent with broad national goals. It will provide a suitable climate for scientific and technological research, and it will enhance the existing resources for this purpose such as manpower, physical facilities, funds and tools for execution. It will activate, coordinate and organize Saudi Arabian scientific and technological research by supervising and conducting specific research projects and by providing effective mechanisms for utilizing and applying the results of this research. The Saudi Arabian National Center for Science [and] Technology will build upon the current and projected university and industry base and will be complementary to other Saudi Arabian institutions.

The 18 research areas that were identified at the Joint Working Group meeting in Riyadh (September 1974) will provide the initial foci of efforts of the Saudi Arabian National Center for Science and Technology (see Section V of these recommendations). In addition, National Research Laboratories may be established to strengthen efforts in those selected areas, among the 18, of unique importance to the development of Saudi Arabia. The current areas of highest priority for national laboratories include water research, arid land research, petrochemical research and environmental research. Further analysis may lead to the identification of the need for additional research areas as well as other national research laboratories.

The long-range development of technology in Saudi Arabia requires a continuing program of research in universities as well as in industry. The SANCST program in this area will have two directions. It will build on present Saudi Arabian resources by awarding grants and contracts to researchers at universities and other research organizations cooperating with these Saudi Arabian institutions. In addition, SANCST will organize and support an in-house research capability, particularly in applied research areas relating to Saudi Arabian national needs.

In the area of science education and training, SANCST will develop programs providing training and research experience for Saudi Arabian personnel (*sic*) both in foreign countries and in Saudi Arabian training institutes. Manpower development programs will be established at all levels, with particular emphasis on the university and technical levels. With U.S. help, SANCST will promote links between U.S. and Saudi Arabian institutions for the long range development of scientific, engineering and technically-skilled manpower.

The selected national Research Laboratories may be located on university campuses, or in certain cases, an entirely new institution, separate from a university, may represent the better option. These research laboratories will bring together a critical mass of scientists, engineers and technicians to create and adapt technology for the solution of pressing economic, environmental and natural resource problems in Saudi Arabia. The laboratories will be staffed by SANCST specialists who represent the chief in-house research capability of SANCST. Building on the results of basic and applied research, the laboratories will develop prototypes and pilot plants to test and demonstrate new technologies tailored to Saudi Arabian needs. Thus, the centers could be a major source of research and development in support of the growth of new industries in the country.

SANCST will recognize the capabilities and autonomy of existing centers and laboratories, for example the Industrial Studies and Development Center, the Central Industrial Testing and

Research Laboratory, and the Central Agricultural and Water Laboratory, and will exchange knowledge and experience with them. SANCST will coordinate its research agenda and activities with other Saudi Arabian research and development activities.

Another major function of the SANCST will be to establish and maintain a scientific and technical manpower information system which will provide essential data for science planning and policy development. There is at present no centralized source of information on the scientific manpower resources on the Kingdom, a lack which impedes planning for the development of effective research activities. The SANCST will be expected to develop a manpower roster which will provide comprehensive information on personnel available in the Kingdom, and on personnel involved in scientific training programs abroad.

Science information is an additional area in which the SANCST will play an important role. There are no well developed research libraries in the Kingdom, and there are no systematic procedures for gaining access to foreign scientific literature. The SANCST will have lead responsibility for correcting this situation with the establishment of an effective science information system, including the planning and implementation of symposia on key scientific and technical issues, with appropriate representation of international experts.

IV. *Organization of the Saudi Arabian National Center for Science and Technology*

The SANCST will be administered by a highly qualified director in accordance with policies established by an autonomous Saudi Arabian Science and Technology Board (SASTB). The members of the SASTB will be Saudi Arabian nationals appointed by the Saudi Arabian Government and the members will be distinguished scientists and technologists. It is intended that the members of the SASTB will represent both the public and private sectors. The SASTB will be responsible for developing and recommending national scientific and technical policies, fully reviewing research plans of the SANCST on an annual basis, and periodically reviewing and approving budgetary requirements to insure meeting the objectives of SANCST.

As shown in Figure 1, the key organizational elements of the SANCST are the five Directorates: Basic Research, Applied Research, National Research Laboratories, Scientific and Technological Education and Manpower, and Scientific and Technological Information. There are two Offices designed to support the research functions of the individual Directorates. The Planning and Evaluation Office will be responsible for developing the policies and procedures of the SANCST. The planning effort will be particularly important during the initial development of the SANCST with the evaluation role rising in importance as the Center matures. This office will also assist the Director in regard to national science policy, long range planning, new program development and annual budget recommendations. Most essential at the onset of the creation of the SANCST will be the professional recruitment responsibility of the Administrative Services Office. The development of the staff will occur simultaneously with the need to obtain clerical and support staff, as well as space and equipment. This Office will also be responsible for the day-to-day administration of the SANCST business, such as overall financial management, and control of grants and contracts.

The specific responsibilities of the various Directorates are as follows:

Basic Research Directorate

This Directorate will be initially organized with three Divisions—one each for Physical Sciences, Life Sciences, and Social Sciences. It will be responsible for administering Saudi Arabian resources for basic research within the priorities established by the Saudi Arabian Government. Basic research will be supported by grants and contracts to universities and other institutions in Saudi Arabia and to research organizations in other countries for specific cooperative investigations in areas related to Saudi Arabian development plans. Projects in all fundamental sciences will be considered.

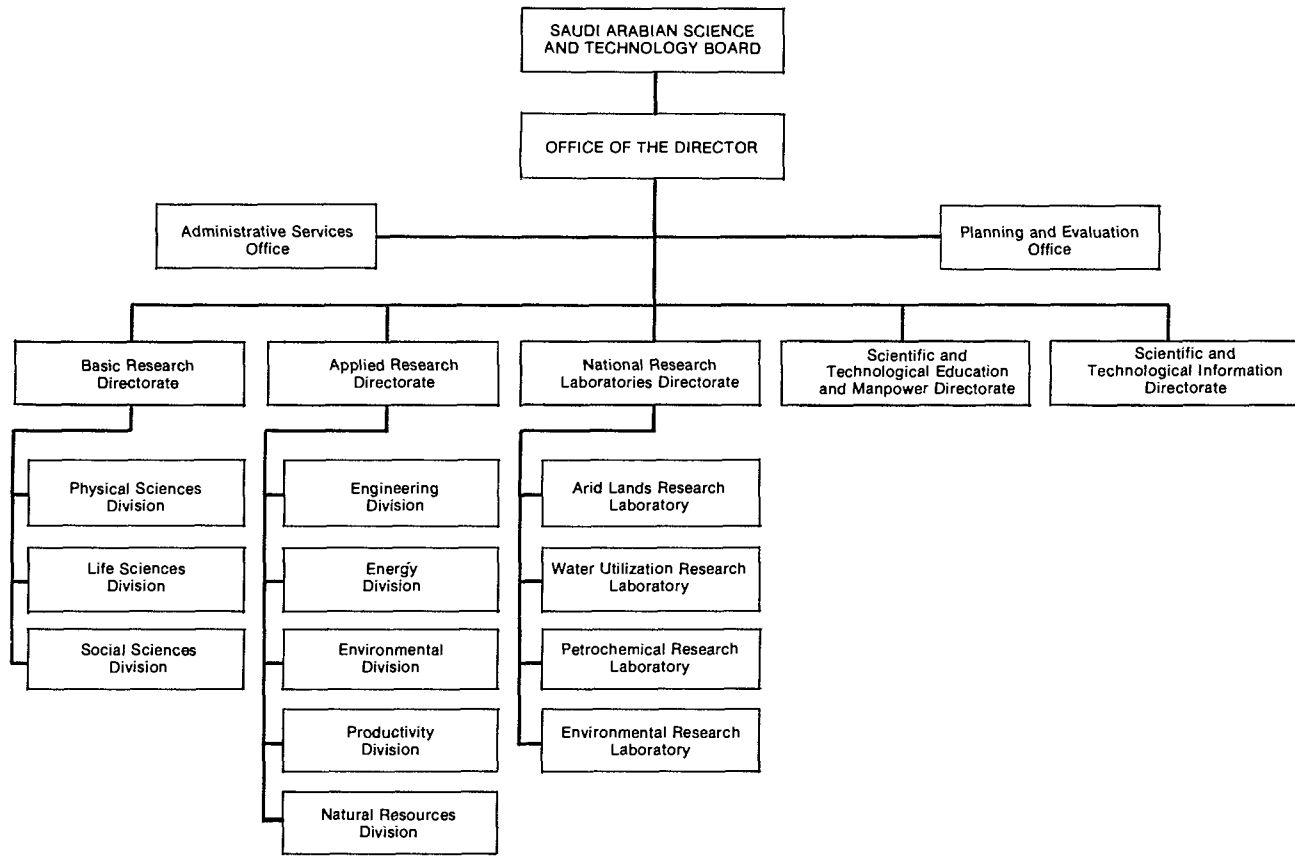


FIGURE 1. ORGANIZATION OF THE SAUDI ARABIAN NATIONAL CENTER FOR SCIENCE AND TECHNOLOGY

Applied Research Directorate

Five Divisions will initially form this Directorate. They will focus on research in the broad areas of Engineering, Energy, Environment, Productivity and Natural Resources. The Applied Research Directorate will support applied research at Saudi Arabian and U.S. and other foreign institutions and undertake specific projects with its own staff. Priority will be given to research projects related to the social and economic development needs of the country, such as water utilization (e.g., quality control, desalination), energy (e.g., solar, conversion, uses of fossil fuels), environment (e.g., public health, land management, urban planning, transportation), productivity (e.g., industrial research and development) and nuclear sciences (e.g., nuclear medicine, food irradiation, agricultural applications). This Directorate will work in close cooperation with the National Research Laboratories.

National Research Laboratories Directorate

Attention will be directed at selected areas of science and technology that have particular importance to Saudi Arabia, through the creation of a number of research laboratories as elements of SANCST. The staff of these laboratories will consist of scientists and engineers from a variety of disciplines, with common objectives. The specific laboratories that will be formed initially are:

- Arid Land Research Laboratory;
- Environmental Research Laboratory;
- Petrochemical Research Laboratory;
- Water Research Laboratory.

A plan will be developed to identify the relationship between these research laboratories and Saudi Arabian universities and other research institutions. As a result of the plan, both the research laboratories and the universities could benefit; for example, the laboratory staff would share library, computer and special facilities with university staff, and the laboratories would provide an opportunity for many students to gain practical experience as a part of their education. Furthermore, the cross-fertilization of ideas resulting from interchanges between the university faculty and the laboratory staff will provide stimulation for both groups.

The cooperative U.S.–Saudi Arabian activities during the first year will lead to recommendations regarding the overall structure and program for the research laboratories as well as the manner in which they should be organized.

The general responsibilities for these research laboratories will be as follows:

- To provide national focus and expertise in those research areas of special interest to Saudi Arabia;
- To create an environment in which national and international experts can work in these areas;
- To monitor international scientific and technological progress in their respective areas and to evaluate the applicability of specific advances to Saudi Arabian needs;
- To conduct comprehensive research and development programs, both experimental and analytical, for solving problems directly affecting the continuing development of Saudi Arabia;
- To develop and adapt emerging technologies for use in Saudi Arabia;
- To operate and maintain facilities for experimentation and testing.

The research laboratories will maintain close contact with the Basic and Applied Research Directorates of the SANCST to assure that wherever possible research activities of the SANCST are related to high priority development projects of Saudi Arabia.

Scientific and Technological Education and Manpower Directorate

This Directorate will be responsible for supporting and improving the training of engineers and scientists in Saudi Arabia both at the university and lower levels. In this role, the SANCST must also address the problem of providing adequate numbers of teachers of science and technology at both the university and secondary school levels.

The manpower element of this Directorate's responsibilities will include developing and maintaining a scientific and technological manpower information system. A roster approach, in which records are kept on each scientific or technically trained individual in the Kingdom, appears not only practical but essential. The information on manpower made available by this system would be an important input to science and technology planning in the Kingdom.

Scientific and Technological Information Directorate

The Scientific and Technological Information Directorate will be charged with developing and executing a plan for the improvement and maintenance of science information facilities and institutions within the Kingdom. These facilities will include both high quality research libraries and adequate means for publishing and disseminating the results of research in addition to conventional libraries and publications. Consideration will be given to the use of modern telecommunications technology to provide links with national, foreign, and international research libraries and scientific and technological media. Such links might make it possible to avoid the necessity for establishing large specialized library collections in Saudi Arabia, while still providing rapid access to the necessary literature.

A staffing plan for the SANCST which would appear to be appropriate to achieve by the end of the first stage of its development is presented in Table 1. The plan provides for a total professional staff of thirty persons with a clerical and services staff totaling twenty persons. Of the professionals, it is anticipated that at least eight would be Saudi Arabian nationals, with the remainder being recruited abroad. It would be desirable, of course, to have as many as possible of this professional staff be Saudi Arabian nationals with appropriate backgrounds in science and technology. It should be emphasized that this will be an interim staff and that it should be expected to grow rapidly as the institution develops.

A preliminary budget for the first full year of operation is presented in Table 2. The budgetary item for Operation of the SANCST is based on the staff level presented in Table 1. Final agreement

TABLE 1. ESTIMATED STAFFING LEVELS FOR THE SAUDI ARABIAN NATIONAL CENTER FOR SCIENCE AND TECHNOLOGY BY THE END OF THE FIRST STAGE OF ITS DEVELOPMENT

	<i>Professional staff</i>		<i>Total</i>
	<i>Saudi</i>	<i>Non-Saudi</i>	
Director	1	—	1
Deputy Director	—	1	1
Administrative Services Office	1	3	4
Planning and Evaluation Office	1	1	2
Basic Research Directorate	1	2	3
Applied Research Directorate	1	6	7
National Research Laboratories Directorate	1	4	5
Scientific and Technological Education and Manpower Directorate	1	3	4
Scientific and Technological Information Directorate	<u>1</u>	<u>2</u>	<u>3</u>
	TOTAL	8	22
	Clerical and services staff		20

TABLE 2. ESTIMATED BUDGET FOR SAUDI ARABIAN NATIONAL CENTER FOR SCIENCE AND TECHNOLOGY FOR THE FIRST FULL YEAR OF OPERATION

<i>Item</i>	<i>Cost in U.S. dollars</i>
Operation of the SANCST including staff salaries, building rentals, operating functions and supplies	\$1,500,000
Recruitment programs, moving expenses for new staff, and staff travel	500,000
Research Projects	1,500,000
Initial funding for Phase I efforts on development of SANCST	<u>2,500,000</u>
	TOTAL
	\$6,000,000

is needed on several issues, such as personnel practices and salary structure, in order to determine a final estimate for this cost category.

The budget for staff recruitment is based on the desire to obtain a highly qualified professional staff in the nucleus for development of the Center. An active recruitment campaign is anticipated.

The budget for the Joint Research Projects represents those funds required for planning and initiation of research projects as structured by the individual SANCST Directorates.

The major funding for the first year is that required to select the principal support contractor to provide for detailed planning of the center, structuring of its programs, design of the facilities, site selection and staffing and budgetary requirements.

V. *Priority Research Areas*

At the meeting of the Joint Working Group on Science and Technology in Riyadh on September 16 and 17, 1974, eighteen specific areas of research were identified as being of high priority for the development of Saudi Arabia and appropriate for cooperative efforts between the United States and Saudi Arabia. These areas constitute the nucleus of the research activities and further areas are expected to be identified at a later date. A brief discussion of each of these areas, with respect to existing capabilities for research and to the role which the SANCST could appropriately plan, follows:

1. *Land and water*

Under the general heading of land and water, the Joint Working Group suggested the need for research on land reclamation, arid land, cloud seeding, water utilization and water desalination. Of these areas, it would appear that the SANCST would have the strongest role to play in arid land and water research. This research could include surveys and descriptions on the resources of Saudi Arabia, studies of the alternative uses to which this land might be put and other appropriate atmospheric and environmental subjects.

2. *Energy*

Research in energy conversion, solar energy, and the optimum use of Saudi Arabian petroleum energy resources will be an important responsibility of the Energy Research Division of the Applied Research Directorate.

3. *Science and technology infrastructure*

A major objective of the entire SANCST will be the improvement and development of the science and technology infrastructure of Saudi Arabia. Initial emphasis will be placed on development of university-based scientific and technical capability, but the SANCST will also be concerned with the development of other research organizations and laboratories.

4. *Basic science and technology linkages with United States universities*

SANCST can benefit from cooperative programs between Saudi Arabian and foreign institutions, especially those in the United States. Thus a major emphasis on the development of linkages between United States and Saudi Arabian universities will flow naturally from the activities of the SANCST. It is expected that United States universities will be among the most important sources of research and developmental aid to Saudi Arabian research institutions.

5. *Industrial research*

The existing capability for industrial research in Saudi Arabia is currently concentrated in small research organizations. There are process control laboratories in several industrial plants, but there does not appear to be a capability to undertake major research programs in many areas of interest to industry. There is no doubt that an expanded research capability would be of value to Saudi Arabia, and the SANCST should assist in its development in all appropriate ways. It should assist in developing contacts with industries in the United States, and consider the question of the establishment of an institute for industrial research within the national laboratory system.

6. *Transportation planning*

Transportation planning is primarily a responsibility of the Ministry of Communications. The SANCST should work with this Ministry in developing appropriate research capability in this area.

7. *Environment*

Environmental research of many types will be increasingly important in Saudi Arabia. Within this general category, it appears that there is considerable opportunity for research in oceanography, and capability in this area is developing at both King Abd al-Aziz University and the University of Petroleum and Minerals. In the field of geology, substantial research has been in progress for a number of years, and there is considerable interest and capability within the universities. There is also considerable need for interdisciplinary research on the environmental effects of industrialization in Saudi Arabia, including consideration of atmospheric effects.

8. *Mineral research and planning*

Research and planning for the exploitation of Saudi Arabia's mineral resources is understood to be primarily a responsibility of the Ministry of Petroleum and Minerals, but the SANCST should consider conducting cooperative research programs in this area. Possible support areas would include research and teaching in mining, mineral beneficiation and smelting.

9. *Technician training*

The Scientific and Technological Education and Manpower Directorate should assist in the development of curricula for use in technician training institutes. Several such institutes are currently being developed by the Ministry of Education, and steps should be taken to ensure the complementary nature of these programs.

10. *Scientific and technical information*

Saudi Arabia requires a national scientific and technical information service to provide ready access to reference materials, journals, technical reports, monographs and other information needed for research and development in all relevant scientific and technical fields. The primary objective of the Scientific and Technological Information Directorate within the SANCST will be to develop and implement a plan for creating the necessary information services. It is anticipated that this directorate would work through foreign non-government contractors in order to develop and operate the needed service.

11. *Application of satellite technology*

Research opportunities in the use of advanced satellite technology to assist Saudi Arabia in assessment and planning for resource utilization or for other forecasting purposes should be explored. These technologies could provide information which would be useful to Saudi Arabia for various planning purposes, and SANCST should perform planning and consider advanced research on the application of these technologies.

MEMORANDUM OF UNDERSTANDING FOR COOPERATION BETWEEN THE GOVERNMENTS OF THE UNITED STATES AND SAUDI ARABIA ON THE ESTABLISHMENT OF THE SAUDI ARABIAN NATIONAL CENTER FOR SCIENCE AND TECHNOLOGY

I. *Introduction*

This document sets forth the terms for an understanding between the United States and Saudi Arabian Governments to work in close cooperation during the period of program planning, implementation, and operation of the Saudi Arabian National Center for Science and Technology (SANCST). During this period, it is anticipated that the Saudi Arabian participation will grow as rapidly as their capability will permit and that the United States participation will proportionately decrease in a mutually agreed upon manner.

The planning phase for this program provides a sound basis for agreement. The implementation and operation phases are, of course, dependent on the products of the planning phase and, therefore, this initial agreement will be more fully defined upon completion of the planning phase.

Both parties recognize and agree that achievement of the milestones called for in this Memorandum of Understanding are contingent upon prompt and proper actions, reporting of results, presentation of plans, and review and approval of requests and funding at the times specified by the mutually agreed upon schedule for the development of SANCST.

The two pacing actions in implementing this Memorandum of Understanding are the dates for establishment of SANCST and appointment of its director. The dates discussed in this Memorandum of Understanding are based upon the accomplishment of these two actions by October 1975.

II. *Organization and management plan for implementation of this Memorandum of Understanding*

The United States Government agrees to promptly establish in Washington, D.C., a SANCST Program Office in the National Science Foundation (NSF). This NSF/SANCST Program Office will be responsible for the program management under the aegis of the United States side of the Joint Commission, and selected Saudi Arabian personnel will be designated to serve in a liaison capacity with the NSF/SANCST Program Office in Washington, D.C.

The NSF/SANCST Program Office will provide the overall coordination and monitoring of the United States private sector, university, and other United States Government participation in the program. The NSF/SANCST Program Office will provide the primary point of contact with the SANCST.

The Saudi Arabian Government agrees to promptly establish a SANCST Authority in Riyadh which will provide the primary United States interface with the Saudi Arabian Government on the SANCST Program. The SANCST will review, approve and fund plans and projects recommended by the NSF/SANCST Program Office. Selected United States personnel will be designated to serve in a liaison capacity with the SANCST in Riyadh.

III. *NSF/SANCST Program office role*

To date, the United States Government, working in close cooperation with the Saudi Arabian Government, has completed a series of advance planning activities which lead to the approval at the first session by the United States-Saudi Arabian Joint Commission on Economic Cooperation to establish the Saudi Arabian National Center for Science and Technology (SANCST). The United States, through the NSF/SANCST Program Office, will provide comprehensive plans for the development of SANCST with special emphasis on the support and conduct of research programs under its aegis intended to strengthen the scientific and technological capabilities of Saudi Arabia. These comprehensive plans will be developed through the NSF/SANCST Program Office and submitted to SANCST for review, approval, and authorization of funds for their implementation.

The primary planning element in the development of SANCST will be the Research Plan. This Plan will identify major program and sub-program research elements and establish the operating procedures for the conduct of each research element within Saudi Arabia and the United States. The Research Plan will be submitted to the SANCST by July 1976.

The NSF/SANCST Program Office will also provide a detailed Personnel Plan for the SANCST. This Personnel Plan will be developed in concert with the detailed Research Plan so that an optimum skill mix will be available from Saudi Arabian and United States institutions for the management and implementation of the research program. The Personnel Plan will be submitted to the SANCST for review and approval by July 1976. The Personnel Plan will provide up to 50 personnel for the SANCST in the first stage of its development.

The NSF/SANCST Program Office will also provide a Science and Technology Equipment Plan to assure equipment and material necessary for the conduct of the Research Plan. The Science and Technology Equipment Plan will be submitted to the SANCST by July 1976 for review, approval and authorization of funds.

The NSF/SANCST Program Office will provide a preliminary plan for the design of the permanent SANCST Headquarters and National Laboratories by July 1976. A final design for the SANCST permanent structure will be submitted to SANCST for review and approval by July 1977.

Pursuant to meeting these objectives, the NSF/SANCST Program Office will, with the review and approval of the Saudi Arabian Government, select a team or teams of experts to carry out required detailed studies, analyses, and conferences in each planning area including overall considerations of the Organization and Management of the SANCST. The NSF/SANCST Program Office proposal for the selection of these teams and the approval by the Saudi Arabian Government should be completed by the end of 1975. The Saudi Arabian Government will authorize dispersal of required funds from the Trust Account for these purposes.

IV. Saudi Arabian Government role

Pursuant to achieving the early and effective establishment of SANCST, the Saudi Arabian Government will promptly develop the necessary procedures for the review, approval, and funding of program plans submitted to the SANCST. It is imperative, in this connection, that the Saudi Arabian Government provide for the phasing in of its SANCST staff in accordance with the implementation plan.

The logistical support for the United States personnel (i.e., housing, transportation, education, etc.) for the SANCST effort will be provided, or approved and funded by the Saudi Arabian Government through mutually agreed upon procedures between the United States Department of the Treasury, Office of Saudi Arabian Affairs and USREP/JECOR, and the appropriate levels of the Saudi Arabian Government.

[Signed]

RIDA OBAID
Chairman

Saudi Arabian Working Group
for Science and Technology

Ad referendum

[Signed]

ALFRED J. EGGERS, Jr.
Chairman

United States Delegation
for Science and Technology

Ad referendum

June 30, 1975

ATTACHMENT A

ESTIMATED MAJOR MILESTONE SCHEDULE

Milestone	Responsibility	Date
1. Establishment of SANCST	SA	Oct. 1975
2. Appointment of SANCST Director	SA	Oct. 1975
3. NSF/SANCST Program Office	USA	Oct. 1975
4. U.S. Liaison assigned to SANCST	USA	Oct. 1975
5. SA Liaison assigned to NSF	SA	Nov. 1975
6. Team Selection:		
— Authorization	SA	Oct. 1975
— Release of RFP(s)	USA	Nov. 1975
— Selection	SA/USA	Feb. 1976
— Approval	SA	Mar. 1976
7. Research plan:		
a. Recommendation	USA	July 1976
b. Approval	SA	Sept. 1976
8. Personnel plan:		
a. Recommendation	USA	July 1976
b. Approval	SA	Sept. 1976

	<i>Milestone</i>	<i>Responsibility</i>	<i>Date</i>
9. S&T equipment plan:			
<i>a.</i> Recommendation		USA	July 1976
<i>b.</i> Approval		SA	Sept. 1976
10. Plan for design of SANCST headquarters and laboratories:			
<i>a.</i> Preliminary plans:			
(1) Recommendation		USA	July 1976
(2) Approval		SA	Sept. 1976
<i>b.</i> Final plans:			
(1) Recommendation		USA	July 1977
(2) Approval		SA	Sept. 1977

ATTACHMENT B

Saudi Arabian Working Group on Science and Technology

Rida M. S. Obaid, *Chairman*, Riyadh University
Mansur M. Aba-Husayn, Riyadh University
Fayez S. Anan, Riyadh University
Saleh A. Athel, Riyadh University
Sammy A. Mosly, Central Planning Organization
Mohamed A. Saadi, Ministry of Agriculture and Water
Jafar A. Sabbagh, Riyadh University
Yousif I. A. al-Turki, Riyadh University

United States Delegation for Science and Technology

Alfred J. Eggers, Jr., *Chairman*, NSF
Bodo Bartocha, NSF
William H. Wetmore, NSF
Gilbert B. Devey, NSF
Robert D. Lauer, NSF
Leonard A. Redecke, NSF
Allen M. Shinn, Jr., NSF
Shirl F. McArthur, American Embassy, Jeddah
Jeffrey D. Peacock, American Embassy, Jeddah
Theodore A. Rosen, Treasury Department

APPENDIX B

NSF/SANCST PROGRAM OFFICE

I. *Purpose*

This Appendix sets forth the role of the NSF/SANCST Program Office and the estimated staffing and funding requirements for its phased development. This Program Office will serve as the focal point in the U.S. Government for coordinating U.S. cooperation with the evolving SANCST organization and will be responsible for U.S. participation in the activities conducted under tasks I-III of this Agreement and activities which may be subsequently agreed.

II. *Responsibilities*

The NSF/SANCST Program Office will provide assistance to SANCST in performing its responsibilities, including but not limited to (a) the development of research, personnel, equipment

and facility plans (such as headquarters designs); (b) the planning and coordination of Saudi Arabian scientific and technical (hereinafter termed scientific) activities; (c) the education and training of scientific manpower and (d) the administration of the scientific program of Saudi Arabia.

In providing the assistance described in Appendices B-F, the NSF/SANCST Program Office will seek the appropriate cooperation from other U.S. Government agencies and assist in developing cooperative relations with the U.S. academic community and the private sector; it will assist SANCST in monitoring their performance.

It is anticipated that the NSF/SANCST Program Office will provide or arrange for assistance in such areas as those listed below. This assistance will be provided in close mutual cooperation and regular consultation with SANCST.

A. *Development*

The primary planning element in the development of SANCST will be the Research Plan. This Plan will identify major program and sub-program research elements and establish the operating procedures for the conduct of each research element within Saudi Arabia and the United States.

The NSF/SANCST Program Office will also provide a detailed Personnel Plan for SANCST. This Personnel Plan will be developed in concert with the detailed Research Plan so that an optimum skill mix will be available from Saudi Arabia and United States institutions for the management and implementation of the research program.

The NSF/SANCST Program Office will provide a preliminary plan for the design of the permanent SANCST Headquarters and National Laboratories. A final design for SANCST permanent structure will be submitted to SANCST for review and approval.

Pursuant to meeting these objectives, and in consultation with SANCST, the NSF/SANCST Program Office will carry out approved detailed studies, analyses, and conferences in each planning area including overall consideration of the organization and management of SANCST. The Saudi Arabian Government will authorize dispersal of required funds from the Dollar Trust Account for these purposes.

B. *Planning and Coordination of Scientific Activities*

The NSF/SANCST Program Office will assist SANCST in:

1. Planning and establishing priorities for SANCST program development;
2. Planning and establishing priorities for Saudi Arabia's scientific activities in accordance with the Kingdom's socio-economic development plans and its indigenous capabilities to conduct such activities;
3. Establishing policies regarding technology transfer and Saudi Arabia's support of basic and applied research;
4. Planning regional and international scientific cooperation programs;
5. Establishing policies, programs and mechanisms for coordination with other Saudi Arabian agencies, the academic community and the private sector relating to science and technology;
6. Planning cooperative science projects.

C. *Education and training*

The NSF/SANCST Program Office will assist SANCST in:

1. Identifying Saudi Arabian scientific and technical training needs as they relate to Saudi Arabia's socio-economic development plans;
2. Providing assistance to other Saudi Arabian agencies in developing scientific curricula and technician training programs;
3. Providing training and orientation to SANCST and other Saudi Arabian personnel in the U.S. and other countries;
4. Conducting seminars, symposia, and other scientific meetings on subjects of concern to Saudi Arabian scientists.

D. *Science Administration*

The NSF/SANCST Program Office will assist SANCST in:

1. Obtaining pertinent information concerning the establishment, operation, and evolution of institutions similar to SANCST;
2. Planning all phases of the phased and evolutionary development of SANCST including (a) technical management and support staff requirements, (b) facility and equipment needs, (c) budgetary planning, and (d) information system needs;
3. Administering arrangements for scientific research done for Saudi Arabia;
4. Developing scientific information systems to serve Saudi Arabia's needs;
5. Publishing newsletters and other publications on scientific matters of concern to Saudi Arabia; and
6. Developing capabilities to plan, manage, and evaluate scientific research programs and activities of Saudi Arabia.

III. *Scheduling of NSF/SANCST Program Office resources*

The NSF/SANCST Program Office will be responsible for the Project management under the aegis of the United States side of the Joint Commission, and selected Saudi Arabian personnel will be designated to serve in a liaison capacity with the NSF/SANCST Program Office in Washington, D.C.

The Office will be staffed in close consultation with SANCST to assure that the numbers and expertise of the personnel accord with SANCST requirements. For planning purposes, the following composition and schedule is anticipated:

Title

Twelve months of salary:

1. Section Head and Secretary (½ time each);

Eleven months of salary:

2. Senior Program Manager (full time);
Program Manager (full time);
Science Information Specialist (full time);
Secretary (full time);

Eight months of salary:

3. Program Manager (full time);
Assistant Program Manager (full time);
Professional Assistant (½ time);

Three months of salary:

4. SANCST Liaison Officer (U.S.) (full time);
Program Manager (full time);

Six months of salary:

5. SANCST Liaison Officer (Riyadh) (full time).

IV. *Cost estimates of first year*

A. *Costs subject to overhead*

1. Personnel compensation and benefits:

In U.S.	\$210,855
In Saudi Arabia	47,850

2. Travel and transportation:		
U.S.-based staff		
Saudi Arabia-based staff		84,350
3. Other direct costs:		
Consultants' pay		40,000
	TOTAL	\$403,455
	40% overhead	161,382
B. Costs excluded from overhead (6 months)		
Housing (3 year lease, furnishings and utilities)		152,000
Automobile lease and motor pool		11,300
Secretary/Administrative Assistant		12,520
	Subtotal	\$175,820
	TOTAL (A&B)	740,657
	10% contingency	74,066
		814,723
	Rounded	\$815,000
C. Other costs		
Individual Work Plans concluded by NSF and SANCST will describe appropriate financial support required for each task.		
Funds available for overhead costs in support of the NSF/SANCST Program Office may be used to defray special expenses relating to official meetings and events in connection with visits of Saudi Arabian personnel to the U.S. for the purpose of this Agreement.		

APPENDIX C

SCIENTIFIC RESOURCES INVENTORY AND EVALUATION (TASK I)

I. Purpose

This Appendix describes generally the objectives of an inventory and evaluation of Saudi Arabia's human and physical resources to be conducted by SANCST with the cooperation of NSF. The objective of this activity will be to provide basic information regarding the Kingdom's current capabilities and thereby facilitate planning for the development of SANCST scientific and technological activities and programs together with facilitating the implementation of other portions of this Agreement.

II. Procedures

A. Inventory existing Saudi Arabian scientific resources

As will be elaborated in a work plan to implement this task, the NSF/SANCST Program Office will arrange for U.S. experts to undertake with appropriate Saudi Arabian officials a study of the Kingdom's scientific resources. This study will:

1. Review available information relating to the Kingdom's scientific and technical capabilities and needs and supplement such information as required;
2. Develop an inventory of scientific and technical personnel in Saudi Arabia including information such as fields of specialization, educational level, and nature of present work;
3. Develop an inventory of foreign scientific and technical personnel working in Saudi Arabia as in 2, above;
4. Study Saudi Arabia's university structure as it pertains to scientific education and existing basic and applied research in Saudi Arabia;

5. Study the structure and function of non-academic institutions engaged in scientific and technological activities; and
 6. Review Saudi Arabia's scientific and technical information systems.
- B. *Evaluation of scientific and technical resources*

Based upon the foregoing data and as an intermediate step in preparation for task III, the study will:

1. Develop recommendations for projects and programs in scientific and technological fields required to meet Saudi Arabia's socio-economic development goals;
2. Develop recommendations concerning Saudi Arabia's short-term needs for scientific and technical manpower and education needs of Saudi Arabia to meet Saudi Arabia's objectives in science and technology;
3. Develop recommendations concerning needed scientific facilities and equipment.

C. *Reports and follow-on*

The inventory of Saudi Arabian scientific and technical resources will be developed to be compatible with current data processing techniques so that it can be periodically updated as a part of the continuing SANCST program, with the assistance of the NSF/SANCST Program Office.

The NSF/SANCST Program Office will provide advice and assistance to SANCST to implement agreed upon recommendations from the evaluation phase of the inventory. As mutually agreed between NSF and SANCST, necessary follow-on studies will be conducted.

III. *Schedule*

Work on this task will begin at the earliest possible date, and will be performed in accordance with an agreed upon work plan. Services provided by the NSF/SANCST Program Office will be reimbursed under Appendix B, while supplementary staff, additional experts and consultants' travel and other direct costs will be compensated under this Appendix.

For planning purposes, the following supplementary expertise is anticipated for the one-year period planned for this task:

- Project Leader ($\frac{2}{3}$ time);
- Secretary to the Project Leader ($\frac{1}{2}$ time);
- 2 Senior Contract Consultants ($\frac{1}{3}$ time);
- 3 Junior Contract Consultants ($\frac{1}{3}$ time);

IV. *Cost estimates for one-year project*

Salary, wages, and payroll burden	\$37,020
Contract consultants' pay	53,000
Domestic and international travel and per diem	49,925
Report compilation, editing, review and publication	10,000
	\$147,945
Overhead at 40% of NSF Costs	59,178
	TOTAL \$207,123
	Rounded to 210,000

APPENDIX D

COLLABORATIVE PROJECTS (TASK II)

I. *Purpose*

The purpose of this Appendix is to elaborate the projected activities and costs under task II of this Agreement. Activities undertaken under this task are designed to assist in developing Saudi

Arabia's scientific and technological needs and to provide training, education, and scientific information to Saudi Arabia's scientific and technical personnel.

The initial projects will form the basis on which a continuing U.S.–Saudi Arabian collaborative program will be developed, and could serve as a model for other Saudi Arabian collaborative international programs. Each collaborative project shall be implemented pursuant to agreed upon work plans.

This Appendix establishes initial budget figures against which individual activities will be reimbursed.

II. *Program activities*

The NSF/SANCST Program Office will provide the professional services required to assist SANCST to develop, implement, manage, and evaluate mutually agreed activities under this Appendix. Initially these may include, but are not limited to:

A. *Preparation and production of a SANCST Newsletter.* This will be published quarterly for circulation to the Saudi Arabian scientific community utilizing the inventory information compiled under task I. It will also provide information on training opportunities, seminars, symposia, and current research of concern to Saudi Arabia.

B. *Science information system.* This would entail developing the initial phases of a scientific information system focusing on information that is directly relevant to Saudi Arabia's socio-economic development needs.

C. *Scientific equipment.* NSF will undertake to provide advisory services on request to SANCST and other Saudi Arabian scientific institutions concerning equipment and supply needs.

D. *Collaborative science projects.* This involves the planning, implementation and management and evaluation of a series of joint U.S.–Saudi Arabian science projects. In accordance with a mutually agreed work plan NSF and SANCST will develop planning and review procedures for SANCST approval of such projects. The projects will be funded from block funds provided under this Appendix for SANCST.

E. *Orientation visits.* This involves selected SANCST or other Saudi Arabian scientists meeting in the U.S. with U.S. counterparts to review areas of mutual interest and possible cooperation. Special consideration will be given to the national development goals of Saudi Arabia and the role of science and technology in meeting those goals. Details of individual programs will be provided in separate work plans.

F. *Training and education of Saudi Arabian scientists.* NSF will assist Saudi Arabia in making arrangements for specialized training and continuing education of Saudi Arabian scientists and technical personnel in U.S. institutions. This assistance will be provided in accordance with separate work plans and agreed procedures for the administration of the programs.

III. *Scheduling of NSF resources*

Work on separate elements of this task will begin at the earliest possible date and will be performed in accordance with individual work plans. Services provided by the permanent staff of the NSF/SANCST Program Office will be reimbursed under Appendix B while supplementary staff, additional experts, consultants and contractors, travel and other direct costs will be compensated under this Appendix.

IV. *Cost estimates for first year*

The figures below are for planning purposes. Detailed work plans and cost estimates will be provided for individual activities. If additional activities requested by SANCST not listed in this Appendix are undertaken, either additional funding will be provided or funds will be shifted from other categories by mutual agreement.

SANCST quarterly newsletter	\$ 100,000
Science information system	685,000
Procurement of scientific equipment	100,000
Collaborative science projects	3,000,000
Orientation	150,000
Education of Saudi Arabian scientists	\$ 100,000
	TOTAL \$4,135,000

APPENDIX E

INSTITUTIONAL DEVELOPMENT OF SANCST (TASK III)

Pursuant to this task, NSF will provide assistance in the development of the Research Plan, Personnel Plan, Equipment Plan, Organization and Management Plans and Facilities Design for SANCST, as outlined in Appendix B, in the planning of Saudi Arabia's science and technology programs and policies, in scientific and technical education, and in the administration of a developing SANCST organization.

In providing this assistance, NSF will draw upon the experience gained in the development and operation of other research organizations (such as the Korean Institute for Science and Technology) and the experience gained from tasks I and II, and any other relevant information bearing on the mid-term development of SANCST. It is anticipated that additional collaborative efforts will be developed by SANCST, NSF, and Treasury for the implementation of specific activities identified during the course of this task. Further detail[s] and estimated costs for this task will be provided following additional planning and consultation.