

PROJECT EVALUATION SUMMARY (PES) - PART I

1. PROJECT TITLE Enhancing S&T Capabilities in LDC's			2. PROJECT NUMBER 931-1223	3. MISSION/AID/W OFFICE AID/SCI
5. KEY PROJECT IMPLEMENTATION DATES			4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code - Fiscal Year, Serial No. beginning with No. 1 each FY) 81-55 <i>11/16/81</i>	
A. First PRO-AG or Equivalent FY _____	B. Final Obligation Expected FY _____	C. Final Input Delivery FY _____	6. ESTIMATED PROJECT FUNDING A. Total \$ <u>3,375,000</u> B. U.S. \$ _____	
			7. PERIOD COVERED BY EVALUATION From (month/yr.) <u>8/1/80</u> To (month/yr.) <u>3/31/81</u> Date of Evaluation Review <u>9/30/81</u>	

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
None		

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

<input type="checkbox"/> Project Paper	<input type="checkbox"/> Implementation Plan e.g., CPI Network	<input type="checkbox"/> Other (Specify) _____
<input type="checkbox"/> Financial Plan	<input type="checkbox"/> PIO/T	_____
<input type="checkbox"/> Logical Framework	<input type="checkbox"/> PIO/C	<input type="checkbox"/> Other (Specify) _____
<input type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P	_____

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

A. Continue Project Without Change

B. Change Project Design and/or Change Implementation Plan

C. Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)

John A. Daly, Project Manager

12. Mission/AID/W Office Director Approval

Signature *[Handwritten Signature]*

Typed Name _____

Date 11/18/81

Summary: The project has been completed and terminated. After an initial delay, mutually agreed upon by AID and NAS, schedules were met. S&T capabilities in LDC's have been improving, and this project has played a needed role in contributing to U.S. and international efforts to achieve that end.

Methodology: This was a desk review by the project manager of accomplishments during the last seven months of the project following a major evaluation.

External Factors: During this project U.S. and world concern for strengthening S&T capacity of LDC's increased. A key element in the period was UNCSTD internationally, and a U.S. policy review on S&T for Development. There was also a significant effort to initiate bilateral S&T cooperation programs with developing countries. An Administration effort to create the ISTC failed in the Congress.

Inputs: AID financing was as programmed, and inputs were timely. AID project management inputs were criticized in the previous evaluation as inadequate, and the situation did not improve in the final seven months of the contract. NAS, U.S. voluntary and host country inputs exceeded targets.

Outputs: Overseas workshops and discussion seminars were as proposed and of good quality. Seven ACTI studies were undertaken as proposed, but five will be finished under a new grant due to slippage in this program element. The ACTI program appears of high quality and products are widely distributed. No special studies were undertaken, although the contract called for one or two per year.

Purpose: The project appears to have had modest success in improving scientific and technological policy decisions in AID and LDC's through the provision of timely expert information and advice. Efforts under this contract to diffuse information on technological innovations such as firewood crops and arid lands plants appear to have stimulated considerable interest and activity in LDC's, and it is expected that studies undertaken under this project will be similarly successful in the future. The Asia Bureau and AID missions in Egypt, Indonesia, Portugal, India and Tunisia are funding, or are considering funding, NAS to carry out country specific activities modeled after those of this project.

Goal: This project is a relatively small part of the U.S. and international effort to strengthen LDC S&T capacity for development. Consequently there are no direct indicators of goal achievement.

Beneficiaries: Direct beneficiaries include approximately 1,000 LDC S&T professionals who have participated in NAS overseas activities, tens of thousands of LDC (and U.S.) professionals who have used NAS studies provided under the project, and scores of AID and other donor officials who have received NAS information services. Since the focus of all NAS activities in this contract are technologies relevant to the basic needs of the poor, the AID target population is the ultimate beneficiary.

Unplanned Effects: A major new AID project has been approved building on NAS strengths used and developed in this project. NAS has obtained funding from other sources to utilize its developmental experience domestically in U.S. Indian reservations. NAS results and personnel were instrumental in influencing some USDA and U.S.-Mexican bilateral research programs.

Lessons Learned: The cumulative effect of the studies program is particularly notable. The major impacts of ACTI studies seen in this project were the results of studies under-

taken from one to three years prior to the start of the project. Each new study appears to gain impact due to the success of previous studies. Follow-up costs are very high - more than \$100,000 in mailings alone each year. Perhaps most important is an entrepreneurial personality for the studies director resulting in extensive, non-formal efforts to diffuse the study information.

ATTACHMENTS

1. "ENHANCING S+T CAPABILITIES IN LDCs" - JOHN A. DALY
2. TABLE 1 - ACTIVITIES COMPLETED.
3. NAS RESPONSES TO RECOMMENDATIONS IN PREVIOUS EVALUATIONS - NAS LTR 9/11/81

Evaluation: Enhancing S&T Capabilities in LDC's

John A. Daly

Introduction: The project titled "Enhancing S&T Capabilities in LDC's" was implemented through a contract with the National Research Council lasting from August 1977 through March 1981. The project funded three types of activities -- overseas workshops, information services for AID, and studies. These are described below.

The National Research Council (NRC) which is the operational arm of the National Academy of Sciences (NAS), the National Academy of Engineering (NAE), and the Institute of Medicine (IOM) plays a unique role in science and technology in the United States. The three membership organizations are composed of the most distinguished members of their respective professions. The NRC, drawing on its membership and the larger professional community, provides disinterested professional advice to the public through a network of advisory committees. This contract was implemented by the NRC Board on Science and Technology for International Development (BOSTID), and in part by the NRC Advisory Committee on Technological Innovation. In the following paragraphs the term NAS will generally be used to refer to the overall implementing agency.

The project was built on the unique capacity of the NAS. Overseas workshops, done by the NAS in cooperation with host country counterpart institutions, were primarily to provide fora for unbiased, informal discussion of S&T policy issues of major perceived importance to the host country. These also, however, were to strengthen host institutions and to encourage cooperation between U.S. and host country scientists. The information services for AID were designed to provide a mechanism to tap the U.S. and LDC professional communities quickly and easily to discuss scientific and technological issues of concern to AID. The studies were to produce monographs on technological issues of particular concern to AID and LDC's, particularly underexploited technologies of potential economic value to developing countries.

Methodology: A major evaluation was completed by a five person team on August 1, 1980. This evaluation was of particular importance due to the consideration at that time of a major new project to be implemented through NRC's BOSTID. Consequently more time and effort was spent on the evaluation than is customary, and the evaluation was very specific on revisions of processes and procedures for the NAS.

In light of the magnitude of this evaluation, completed seven months prior to the end of the contract, the current evaluation is primarily an update, done by the project manager. The Attachment is a report provided by the NAS, reviewing compliance with the recommendations of the last evaluation, and providing final data on project activities and costs.

Overall Project Accomplishments: The outputs of the program are shown in Table I. During the three and one-half years of the contract NAS carried out 12 overseas workshops (12 planned) and 10 discussion seminars (12 planned). Under the study program eight studies were undertaken under the project, one with cofinancing from another office (10-12 planned). Of these only two have been completed, and the remainder are in review. (As an administrative convenience, reprints

scheduled for printing under the new grant were printed under the project, and an equal amount under the new grant reserved for publication of the remaining studies as they appear.) There were two additional feasibility meetings that did not result in studies under the contract, and one previous study was translated into French (cost of \$46,000).

The project was completed within the original budget (\$3,375,000) with a six month, no cost extension mutually agreed upon. It is estimated that 320 persons have contributed 4296 person days of scientific and technical effort to the program without remuneration (valued at \$837,000 if paid at \$192 per person day). Counterpart organizations in overseas activities are estimated to have contributed at least 6368 person days of labor to the program.

Overseas Program: The direct costs associated with the twelve overseas workshops were \$307,947. However, allocating staff costs and indirect costs it is estimated that this portion of the program had a total cost of \$1,087,493. Individual workshops are estimated to have ranged from \$53,757 for the Caribbean workshop (organized in cooperation with the British Commonwealth S&T organization) to \$125,005. Average cost per workshop was estimated at \$90,624, and it is assumed that per workshop costs increased over the course of the contract due to inflation. It is noted, however, that some of the overhead involved in the overseas program involves development of S&T cooperation with LDC's, an objective of the project which is not reflected in the quantified evaluation indices of the logical framework.

The success of individual workshops varied according to the circumstances in the host countries. Overall the previous evaluation felt the quality of NAS effort in the first 10 workshops was high. The two workshops taking place after that evaluation were in Morocco and Nepal. Both were judged successful overall, although the NAS was somewhat criticized for failure in communications with the host organization in Morocco.

Discussion Seminars: Average cost for the ten discussion seminars was estimated to be \$31,137, with a range from \$28,500 to \$37,500. The one seminar completed after the last evaluation was at lower than average cost. Generally the previous evaluation found these seminars to be of high quality and well regarded in AID, and the final one appears to share these characteristics.

Studies: The failure of NAS to complete five of the seven studies initiated under this contract during the period of the contract is of major concern per se, and also complicates the evaluation of this program element. Costs per study can only be approximated and study quality can not be ascertained.

It is estimated that the total costs for the studies program over the life of the project are approximately \$1,400,000 (counting feasibility meetings and the co-financing for the Water Buffalo study). This cost includes not only the production of the seven new studies, but a major distribution program which responds to requests for 12 studies produced under previous projects, and considerable staff effort in technological diffusion. Reprint costs alone amounted to \$150,000.

Individual studies vary from quite small reports (Winged Bean and Aerial Seeding) to what will be major monographs (Water Buffalo and Productive Utilization of Wastes). Consequently per unit costs have little generalizability.

The two studies which have been completed under this contract both appeared since the last evaluation. The Aerial Seeding report appears to be a high quality effort of modest pretensions. The Supplement to Energy for Rural Development is a useful monograph that was widely distributed at the UN Conference on New and Renewable Sources of Energy (although it appears to be of rather variable internal quality).

Compliance With Recommendations of the Previous Evaluation: The attachment documents NAS efforts to comply with the major recommendations of the previous evaluation. The efforts have been significant and seriously undertaken. The impact of these efforts could not be adequately measured in the final seven months of the contract. They were largely oriented to preparation for efforts under the new project, funded in January 1981, and the impact of the reforms will be measured in the evaluation of that project.

Table I
Activities Completed

Workshops

1)	June 1978	Cameroon	Management of Agricultural Research
2)	September 1978	Philippines	Technology for Rural Development
3)	December 1978	Sudan	Aquatic Weed Management: Gezira Canals
4)	April 1979	Caribbean	Regional Meeting on Natural Products
5)	July 1979	Jordan	Science and Technology in Jordanian Development
6)	September 1979	Mauritania	Mauritanian Environmental Panel
7)	November 1979	Costa Rica	Energy Development
8)	December 1979	India	Postharvest Food Conservation
9)	February 1980	Sri Lanka	Postharvest Food Losses
10)	March 1980	Ghana	Research Management for Development Planning
11)	December 1980	Morocco	Science and Technology Policy
12)	February 1981	Nepal	Renewable Natural Resources

Discussion Seminars

1)	April 1978	Urban Problems in Developing Countries
2)	October 1978	Regional Science and Technology Development in the Middle East
3)	March 1979	New Mechanisms for Applying S&T to LDC Problems
4)	June 1979	Techniques for Large Scale Revegetation
5)	October 1979	Appropriate Technologies for Health Care Delivery
6)	February 1980	Research Priorities Within the Foreign Assistance Program
7)	March 1980	Review of Future Directions for AID's DS/ST
8)	June 1980	Two-way Radio Communication for Rural Health Services
9)	May 1980	Conventional Energy Training
10)	January 1981	AID Strategy in Remote Sensing, Forestry, Environment and Natural Resources

ACTI Studies

- 1) The Winged Bean (Revision) (not completed, and final printing transferred to the new grant)
- 2) The Productive Utilization of Wastes in Developing Countries (not completed, and final printing transferred to the new grant)
- 3) The Water Buffalo (cofinanced with DS/AGR) (not completed, final printing under DS/AGR financing)
- 4) The Potential for Alcohol Fuels in LDC's (not completed, and final printing transferred to the new grant)
- 5) Supplement to Energy for Rural Development
- 6) Land Imprinting (not completed, and final printing transferred to the new grant)
- 7) Aerial Seeding of Forests
- 8) Producer Gas for Motor Transport (not completed, and final printing transferred to the new grant)

NATIONAL ACADEMY OF SCIENCES
NATIONAL RESEARCH COUNCIL
2101 Constitution Avenue Washington, D.C. 20418 USA

COMMISSION ON INTERNATIONAL RELATIONS

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September 11, 1981

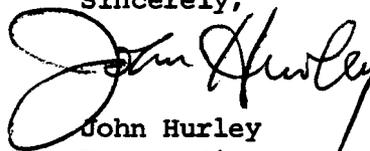
Dr. John Daly
Staff Specialist for Scientific Affairs
Bureau for Science and Technology
Room 515, Building SA-18
Agency for International Development
Washington, D. C. 20523

Dear John:

The enclosed material is in response to your request for information related to the end-of-project evaluation of Project No. 931-1223, Contract No. AID/ta-C-1433, between the National Academy of Sciences and the former Office of Science and Technology, Development Support Bureau, Agency for International Development. The documents provided address actions taken in response to recommendations made in the previous AID evaluation of the project (August 1, 1980), plus updated specific information you requested from appendices to the earlier evaluation.

Please let me know if you have questions about this material or if additional information is requested.

Sincerely,



John Hurley
Deputy Director
Board on Science and Technology
for International Development

Enclosures

JH:em

RESPONSES TO RECOMMENDATIONS IN PREVIOUS EVALUATION

This document outlines the responses that have been made by the National Academy of Sciences and BOSTID to recommendations in the August 1, 1980 evaluation of the project "Enhancing S&T Capabilities in LDCs," Contract No. AID/ta-C-1433. The evaluation report contained a summary of findings and recommendations beginning on page 16. Two broad recommendations were made, namely that the NAS/BOSTID program should be broadened and that within AID steps should be taken to coordinate use of an expanded NAS effort by regional bureaus and country missions. These broad recommendations have been met through BOSTID's development of an expanded program, including a research grants activity, and the subsequent provision of a five-year grant from AID to support this program. An interbureau advisory committee has been established within AID to help coordinate wider awareness and use of the resources in this program. The more specific recommendations which were made beginning on page 17 of the report are listed below with BOSTID responses.

1. Under an expanded program, there would have to be a larger BOSTID staff and, of critical importance to assure quality and credibility, more frequent meetings of the Board itself, coupled with a suitable executive committee or standing committee structure.

Response: Since receiving the five-year grant from AID in late January 1981 that provides for an expanded BOSTID program, several new professional staff members have been recruited. The positions are as follows:

- Executive Secretary, Committee on Research Grants (Michael Greene)
- Assistant to the Executive Secretary, CRG (Tresa Bass, formerly in a different BOSTID position)
- Professional Associate working with health-related activities (Karen Bell, on assignment from the Institute of Medicine staff)
- Publications Coordinator (Sabra Bisette)
- Professional Associate working with overseas programs (David Mog)
- Professional Associate working primarily with science and technology information programs (Judith Werdel, formerly in a different CIR position)

--Professional Associate working with the studies program (position has been offered to a candidate and is expected to be filled in October)

Besides the professional staff positions, seven support staff positions have been added.

A list of the current BOSTID staff is attached.

With regard to reorganization of the committee structure, BOSTID has taken two major initiatives. A distinguished international Committee on Research Grants (CRG) has been appointed to provide overall direction for that new effort. In addition, a new Advisory Committee on Health, Biomedical Research, and Development (ACHBRD) has been established in cooperation with the Institute of Medicine. As a result, the overall policy-making and oversight functions of the Board are now supplemented by the work of three advisory committees--ACTI, CRG, and ACHBRD.

2. In a new project, there should be an improved financial management system so that personnel costs and indirect costs can be more easily tied to project functions and outputs.

Response: Previously, all personnel costs for BOSTID activities were shown in single account numbers by support staff and professional staff. Personnel costs are now broken down by the four major program categories (overseas activities, studies, provision of information, and research grants), plus management activities. Costs for supporting activities such as evaluation and program development are also allocated by the four major program categories. All other direct program costs (transportation, communications, etc.) are allocated to specific activities within the four major program categories, such as individual studies, workshops, discussion seminars, etc.

In order to facilitate accounting for the large number of subgrants that will be made to overseas institutions through the research grants program, consideration is being given to providing a computer terminal in BOSTID and to developing the necessary programs to store financial and administrative information on each subgrant.

3. In view of what may be increased difficulty in locating and attracting the uncompensated S&T experts who would be needed in an expanded program, NAS/BOSTID should consider a more formal system to identify and attract participants.

Response: BOSTID has begun to take a series of steps designed to improve its capability to identify appropriate participants for activities as well as to increase its information resources in other ways. BOSTID now has access to over 100 data bases through Lockheed's DIALOG information retrieval service, and staff members are increasingly using this resource for literature searches to indicate persons with experience relevant to particular kinds of projects. In addition, BOSTID is arranging for a terminal connected to the main NAS computer and will be able to develop better systems of storage and retrieval of information on participants in project-related activities. In this connection, the BOSTID librarian is presently abstracting biographic data on participants in earlier BOSTID activities. Through use of the computer or BOSTID's word-processing system, an information base of persons experienced in LDCs and in particular fields of science and technology will be developed.

4. NAS/BOSTID should intensify use of its newly-designed evaluation system, including increased follow-up visits to workshops and a survey of NRC reviews of ACTI monographs in order to identify measures which would improve quality.

Response: BOSTID will continue its use of previously-established evaluation procedures for its projects and proposes evaluation procedures in each project agreement letter. Evaluation procedures that should apply to the research grants program have been given particular attention. An ad hoc meeting to discuss these procedures was held on August 6, and a brief report of that meeting is attached.

5. We believe the NAS overseas grant and contracts management procedures are likely to require careful scrutiny if an expanded program involves subgrants or subcontracting.

Response: Because the new research grants program will involve subgrants to institutions in developing countries, the NAS and BOSTID have been giving special effort to the creation of effective management and monitoring practices for these subgrants. Several meetings have been held among the BOSTID CRG and administrative staff, the NAS Office of Contracts and Grants, and the NAS controller (who have been most helpful), and a detailed set of procedures are being developed for review by AID's appropriate contracting office.

6. The system of producing and reviewing ACTI reports requires attention so that there is a more rapid completion of reports.

Response: As mentioned in the response to recommendations concerning an expanded staff, a publications coordinator has been added. The person holding this position has wide experience both with editing technical publications and with the publication process.

BOSTID has also installed a text processing system and is currently in the process of upgrading the system by providing for a larger storage capability and increasing the number of terminals. The ACTI staff will soon have access to their own word processing terminal. Steps are also being taken to better coordinate procedures such as finding appropriate pictures and illustrations with the drafting and review of reports so that time is not unnecessarily lost in such operations. A professional staff member has also been added to the ACTI staff and a NRC fellow, who is not charged to the AID contract, is spending part time working on marine reports that will be done under the expanded program. Careful attention is also being given to the costs of BOSTID publications. By using a slightly different grade of paper in a reprint of an ACTI report, for example, about \$3000 was saved in publication costs.

7. To broaden awareness throughout AID of NAS resources and capabilities, we suggest a series of presentations to the Administrator's senior staff, the regional bureaus and a joint presentation to concerned central staff bureaus on the status of NAS present and prospective activities that relate to foreign assistance priorities. Similarly, a video tape should be prepared by NAS that USAIDs could use for their own staffs and relevant host country officials that reflects the breadth of NAS/BOSTID.

Response: BOSTID has taken a number of specific steps to increase awareness of BOSTID and NAS/NRC resources throughout AID. First, during the Spring of 1981, a series of meetings was held with each of the regional bureaus of AID and with the other central AID bureaus and major technical groups. At these meetings, senior members of the BOSTID staff described the expanded BOSTID program, and the way in which BOSTID provides AID with access to other resources of the NAS/NRC and the scientific and engineering communities generally, and solicited suggestions on the types of activities that seemed most useful to AID staff within the context of the program. Additionally, a quarterly newsletter, "BOSTID Developments," has been established, and three issues have been produced so far. This newsletter describes the major activities being planned within BOSTID, provides information on travel by BOSTID staff members or committee members, gives a calendar of forthcoming meetings and events, describes activities in other parts of the NAS/NRC relevant to developing countries, and reports on general matters of interest in connection with the application of science and technology to development problems. About 2,000 copies of this newsletter are sent to AID missions, American embassies and information offices, AID Washington, national and international development agencies, and governmental and scientific institutions in developing countries. BOSTID has also prepared and widely distributed an attractive brochure describing its activities and a list, updated periodically, of its published reports. In addition, BOSTID provides sufficient copies of the Quarterly Management Report to ensure copies are available to all AID interbureau members.

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August 7, 1981

MEMORANDUM TO THE RECORD

BY: Tresa Bass

SUBJECT: Evaluation meeting for Research Grants Program
August 6, 1981

The criteria used to evaluate research grant proposals will be an important means for encouraging high quality work by individual grantees and a successful program. To complement staff and CRG thinking about these criteria, a small informal brainstorming meeting was held August 6, 1981, with the following participants who have experience and interest in program design and evaluation:

Mr. Princeton Lyman, Deputy Assistant Secretary for Africa,
Bureau for Africa, Department of State;

Ms. Molly Hageboeck, Office of Evaluation, Bureau for Program Policy
Coordination, Agency for International Development; and

Mr. Mario Kamenetzky, Science and Technology Unit, The World Bank.

A summary of the discussion follows.

Technical Review

Differing views of the role and merit of technical review emerged. Technical review is necessary to examine the proposed methodology for the research work, confirm its scientific "sense," and serve as independent double check. However, the technical review will add a delay to the granting process, perhaps duplicate work of the CRG and its staff, and may lead to confusion and resentment on the part of the potential grantees if their projects are reviewed unfavorably by U.S. scientists. Criteria used for the technical review must be structured to match the capability of potential grantees and should not be so stringent that no proposing institution can meet them. The Program is designed to achieve knowledge gain in the various project areas, and to develop the capacity for research

in developing country institutions. With each research grant, the capacity of the institution will grow so that it can meet increasingly strict criteria.

Technical reviewers might also be used at the time of the initial selection of project areas, and to identify other researchers working in related areas. The same technical reviewers who evaluate the research proposal should evaluate the outcome of the research to ensure that they will be aware of and involved in the ultimate result. The technical review should not be so conservative that it screens out all "high flying" research ideas.

Relevance of Proposed Research

Criteria which should be applied in evaluating the relevance of proposed research include:

- who will use the end product? will it be used only in that particular country or elsewhere? if certain research work is not relevant to a given country, but of great importance to other countries, is it worth doing any way?
- will the product be affordable in the country where the research is being done?
- do the project areas being selected reflect developing country needs, or are they dominated by U.S. perceptions of priorities?
- can the research be replicated?

Criteria for evaluation of success

Criteria for evaluation of scientific research may be different from those for applied research such as testing varieties of plants. As a first step, the objectives of the research should be stated in verifiable terms and identify what is expected at the end of certain periods. If a hypothesis is proven false after testing, the result is not termed a failure. Indeed, the knowledge that it is not valid is valuable. The work may also lead to alternate paths of inquiry. A change in the direction of the work is acceptable when based on knowledge gained.

Evaluators must keep in mind that these projects won't produce readily usable results quickly. A time realistic frame is necessary.

Capacity building considerations

Some criteria which are important in assessing the ability of an institution to do the research are

- strength of the department or institution
- capability of the institution to fund its own research or draw research funds from elsewhere

-- quality of the proposed research team

An individual research leader or "superstar" may be the principal investigator, but leave most of the work to students. It is important to know the background and capability of the people who will actually be doing the work, and if they are not currently employed by the institution, whether suitable people can be recruited in the country.

Good researchers in a particular area may be driven to industrialized countries if their work is not considered a priority area by their institution or country.

The issues of salary topping, incentives, and payment of salary for the principal investigator are important, and will have to be addressed in individual grant cases depending on local practice and capability of the institution.

Networking

The organizational meetings will facilitate contact and coordination among various grantees in a project area. However, there may be cases where countries are unwilling to share knowledge about areas in which a comparative advantage to one or more of them exists.

If researchers have good contacts with others working on the same topic, they become better able to plan the next stage of the work based on what they and others are doing.

The networking system established should not depend on NAS coordination but on the institutions themselves so that it will continue after grant funding ceases. NAS plans to encourage one grantee in each project area to publish a newsletter dealing with work in the area for circulation to grantees and other interested institutions.

Nonprogress by Grantees

In other granting programs, there have occasionally been problems with grantees whose progress on the work is minimal. In such cases, it is sometimes useful to get the researchers and institution administrators together to discuss any problems which might be causing the delay. While it may be possible to avoid this situation by carefully selecting institutions to receive grants, it was noted that the problem of lagging work on research exists even in top U.S. universities. If conditions which might impede the research work are identified before the grant is made, correcting these conditions may be a condition precedent for receipt of the first payment.

One method used successfully by the International Rice Research Institute (IRRI) to encourage steady work on projects is publication of a newsletter containing results from all of them. Grantees lose face when they don't complete the work and send in the results in time for publication.

Next Steps

All participants agreed that many problems will be avoided by establishing written evaluation criteria at the outset of the Program and obtaining agreement by CRG, grantees, and AID. To help clarify thinking about which criteria should be used, CRG staff will diagram the stages in the granting process, and from a list of all potential criteria, identify which criteria apply (and in what form) at the various stages.

NAS MAJOR PROJECT ACTIVITIES

<u>Activity Agreement No.</u>	<u>Time</u>	<u>Description</u>
<u>Workshops</u>		
2	June 1978	<u>CAMEROON</u> - Management of Ag. Research
3	Sept. 1978	<u>PHILIPPINES</u> - Technology for Rural Dev.
6	Dec. 1978	<u>SUDAN</u> - Aquatic Weed Mgmt; Gezira Canals
13	April 1979	<u>CARIBBEAN</u> - Regional Meeting on Natural Products
19	July 1979	<u>JORDAN</u> - Science & Technology in Jordanian Dev.
27	Sept. 1979	<u>MAURITANIA</u> - Mauritanian Environmental Panel
16	Nov. 1979	<u>COSTA RICA</u> - Energy Development
23	Dec. 1979	<u>INDIA</u> - Postharvest Food Conservation
24	Feb. 1980	<u>SRI LANKA</u> - Postharvest Food Losses
N/A	Mar. 1980	<u>GHANA</u> - Research Mgmt for Dev. Planning
34	Dec. 1980	<u>MOROCCO</u> - Workshop Science & Tech. Policies
35	Feb. 1981	<u>NEPAL</u> - Workshop Management of Ren. Nat. Resources
<u>DISCUSSION SEMINARS</u>		
11	Apr. 1978	Washington - Urban Problems in Devel. Countries.
5	Oct. 1978	Washington - Regional Service & Technology Devel. in the Middle East
14	Mar. 1979	Washington - New mechanisms for applying U.S. Science & Technology to LDC problems.

Activity Agreement No.	Time	Description
18	June 1979	Washington - Techniques for Large-Scale Revegetation.
25	Feb. 1980	Washington - Research Priorities within Foreign Assistance program
28	Oct. 1979	Washington - Appropriate Technologists for Health Care Delivery
30	Mar. 1980	Washington - Review of Future Directions of AID's DS/ST
33	June 1980	Washington - 2-way communications for Rural Health Service
36	May 1980	Washington - Conventional Energy Training
37	Jan. 1981	Washington - Rem. Sensing, Forestry, & Environ. and Nat. Resources
<u>ACTI STUDIES</u>		
7	July 1979	Panel on Water Buffalow; Gainesville, Fla.
8	N/A	New Edition of ACTI Report - <u>The Winged Bean</u>
10(Ref 17)	Jan. 1979	Advisory Study of need for supplement to ACTI Report <u>Energy for Rural Development</u>
12	Apr. & Aug. 1979	Panel for Report, <u>The Productive Utilization of Wastes in Developing Countries</u>
15	June & Dec. 1979	Panel for Report, <u>The Potential for Alcohol Fuels in Developing Countries</u>
17(Ref 10)	N/A	Revision & Editing of <u>Energy For Rural Devel.</u>
21	Sept. 1979	Panel for possible publication of <u>Land Imprinting, A Promising New Technology For Arid Lands; Tucson, Ariz.</u>
22	Nov. 1979	Study of Aerial Seeding of Forests. Alabama & Louisiana
26	Apr. 1980	Study of <u>Producer Gas For Motor Transport Gainesville, Fla.</u>
31	Mar. 1980	Feasibility meeting for Study of Catalytic Oxidation. Washington
32	May 1980	Feasibility meeting for Study of Vegetable oils as diesel fuels

EVALUATION: "Enhancing S&T Capabilities in LDCs"Project Inputs and Outputs

Item	Proposed		Actual
	Proj. Paper	Contract	
<u>INPUTS</u>			
I. <u>AID</u>			
Professional Mgmt	8 mm	--	
Sec'tarial Support	N/S	--	
Funding: TAB/OST (DS/ST)	\$3.375 Mil-		\$3.375 million
Regional Bureaus	lion N/S	--	1,244 milli
USAIDs			2,111 milli
Evaluation: at end year 2	(Oct. 1979)		July 1980
II. <u>NAS</u>			
Professional Mgmt	12 full time	N/S	17
Administrative & Clerical	8	# N/S	10
Contributed Advisory Services of Scientists & Engineers	300 persons @5-10 days ea (1,500- 3,000 days)	# N/S	4615 person days
III. <u>Counterpart Inputs</u>	Not mentioned	Not mentioned	6368 person days
<u>OUTPUTS</u>			
Workshops	4 yr; 12 tot	4 yr; 12 tot	12
Discussion Seminars	4 yr; 12 tot	# N/S	11
Feasibility Studies	4 yr; 12 tot	No mention	
ACTI Studies	3 yr	7 ex. given 3-4 studies 1st year	11 * (Includes 2 titled feasibility studies)
Advisory Missions	--	2 mentioned	Not able to be distinguished
Special Studies	--	1-2 ea yr.	from other studies
Advisory Panels for AID	--	# N/S	seminars

* As mentioned in text, Section II, the PP & contract are unclear as to what constitutes a "study". This figure is the number of panels, reviews, or discussions on subjects for possible publication - not the number of new publications.

NOTE ON THE NATIONAL ADVISORY COMMITTEE
ON TECHNOLOGY INNOVATION (ACTI)

The NAS Advisory Committee on Technology Innovation was established in 1971. Its function has been described as offering practical technological solutions to development problems in a readable style aimed for an audience of decision makers in the governments of developing countries. In these reports ACTI tries to uncover innovations in scientific consciousness and literature and play a middle-man role in helping build the confidence of decision makers in taking action.

The range of ACTI interests and their application to problems of development can be seen in the listing of the reports it has published that are currently available as well as by the listing of reports now in preparation. Currently available reports include:

8. Ferrocement: Applications in Developing Countries. 1973. 80 pp.

Assesses state of the art and cites applications of particular interest to developing countries—boat-building, construction, food and water storage facilities, ect. NTIS Accession No. PB 220-825. \$9.00.

14. More Water for Arid Lands: Promising Technologies and Research

Opportunities. 1974. 153 pp. Outlines little-known but promising technologies to supply and conserve water in arid areas. NTIS Accession No. PB 239-472. \$8.00 (French-language edition is available from Office of Science and Technology, Development Support Bureau, Agency for International Development, Washington, D.C. 20523 or through NTIS, Accession No. 274-612. \$8.00.)

16. Underexploited Tropical Plants with Promising Economic Value. 1975.

187 pp. Describes 36 little-known tropical plants that, with research, could become important cash and food crops in the future. Includes cereals, roots and tubers, vegetables, fruits, oilseeds, forage plants, and others. NTIS Accession No. PB 251-656. \$12.00.

17. The Winged Bean: A High Protein Crop for the Tropics. 1975. 43 pp. Describes a neglected tropical legume from Southeast Asia and Papua New Guinea that appears to have promise for combatting malnutrition worldwide. NTIS Accession No. PB 243-442. \$6.00.
18. Energy for Rural Development: Renewable Resources and Alternative Technologies for Developing Countries. 1976. 305 pp. Examines energy technologies with power capabilities of 10-100 kilowatts at village or rural level in terms of short-and intermediate-term availability. Identifies specific research and development efforts needed to make intermediate-term applications feasible in areas offering realistic promise. NTIS Accession No. PB 260-606. \$17.00. (French-language edition is available from Office of Energy, Development Support Bureau, Agency for International Development, Washington, D.C. 20523.)
19. Methane Generation from Human, Animal, and Agricultural Wastes. 1977. 131 pp. Discusses means by which natural process of anerobic fermentation can be controlled by man for his benefits, and how the methane generated can be used as a fuel. NTIS Accession No. PB 276-469. \$10.00.
21. Making Aquatic Weeds Useful. Some Perspectives for Developing Countries. 1976. 175 pp. Describes ways to exploit aquatic weeds for grazing, and by harvesting and processing for use as compost, animal feed, pulp, paper, and fuel. Also describes utilization for sewage and industrial wastewater treatment. Examines certain plants with potential for aquaculture. NTIS Accession No. PB 265-161. \$12.00.
22. Guayule: An Alternative Source of Natural Rubber. 1977. 80 pp. Describes a little-known bush that grows wild in deserts of North America and produces a rubber virtually identical with that from the rubber tree. Recommends funding for guayule development. NTIS Accession No. PB 264-170. \$8.00.

25. Tropical Legumes: Resources for the Future. 1979. 331 pp.

Describes plants of the family Leguminosae, including root crops, pulses, fruits, forages, timber and wood products, ornamentals, and others. NTIS Accession No. PB 298-423. \$18.00

26. Leucaena: Promising Forage and Tree Crop for the Tropics.

1977. 118 pp. Describes *Leucaena leucocephala*, a little-known Mexican plant with vigorously growing, bushy types that produce nutritious forage and organic fertilizer as well as tree types that produce timber, firewood, and pulp and paper. The plant is also useful for revegetating hillslopes and providing firebreaks, shade, and city beautification. NTIS Accession No. PB 268-124. \$10.00.

27. Firewood Crops: Shrub and Tree Species for Energy Production.

1980. 237 pp. Examines the selection of species suitable for deliberate cultivation as firewood crops in developing countries. NTIS Accession No. PB 81-150-716.

28. Microbial Processes: Promising Technologies for Developing Countries. 1979. 198 pp. Discusses the potential importance of microbiology in developing countries in food and feed, plant nutrition, pest control, fuel and energy, waste treatment and utilization, and health. NTIS Accession No. 80-144-686.

Reports now in preparation include: (working titles)

Food, Fuel and Fertilizer from Organic Wastes.

The Water Buffalo: An Underexploited Resource.

The Potential for Alcohol Fuels in Developing Countries.

Revegetating the Range: Selected Research and Development Opportunities.

Sowing Forests from the Air.

Energy for Rural Development: A supplement.

Wood Gas: A little-known fuel for Motor Transport.

The Winged Bean: A high protein crop for the Tropics. (Second edition)

Mosquito Control: Some Perspectives for Developing Countries.

Food Science in Developing Countries.

Roofing in Developing Countries: Research for new Technologies.

Related Publications Produced with ACTI assistance:

Products from Jojoba: A Promising New Crop for Arid Lands (out of print)

Jojoba: Feasibility for Cultivation on Indian Reservations in the Sonoran Desert Region (out of print)

An International Centre for Manatee Research

APPENDIX F

Committee Members/Panelists* Involved in BOSTID Activities
(October 1977 - July 1980)

*Does not include peripheral participants such as research contacts, contributors, or report reviewers.

Total Participants in Contract Projects

320

Time Contributed by Participants

approximately 4296 days

	<u>No. of Participants</u>	<u>Total Days</u>
BOSTID Members	23	690
ACTI Members	7	140
1. Discussion Seminar--Fast-Growing Trees for LDCs	1	2
2. Cameroon-Workshop on Management of Agricultural Research	5	90
3. Philippines--Workshop on Technology for Rural Development	8	96
4. French Translation of Resource Sensing from Space	--	--
5. Discussion Seminar--Regional Science & Technology in the Middle East	14	28
6. Sudan--Workshop on Aquatic Weed Management in Gezira Canals	7	126
7. ACTI Study--The Water Buffalo: Its Potential for LDCs	26	332
8. ACTI Study--The Winged Bean (second edition)	--	25
9. Assessment of Brazil Chemistry Program	6	44
10. Feasibility of Supplement to ACTI Report, <u>Energy for Rural Development</u>	8	16
11. Discussion Seminar--Urban Problems in LDCs: The Role of S&T	9	42
12. ACTI Report--The Productive Utilization of Wastes in LDCs	24	337
13. Caribbean--Regional Meeting on Natural Products	7	63
14. Discussion Seminar--New Mechanisms for Applying U.S. S&T to LDC Problems	15	30
15. ACTI Report--The Potential for Alcohol Fuels in LDCs	16	273
16. Costa Rica--Workshop on Energy Development	10	120
17. ACTI Report--Supplement to <u>Energy for Rural Development</u>	--	9

	<u>No. of Participants</u>	<u>Total Days</u>
Discussion Seminar--Techniques for Large-Scale Revegetation	13	26
19. Jordan--Panel on S&T in Jordanian Development	5	50
20. Feasibility Study--Internatl. Workshop on Energy Survey Methodologies	7	14
21. ACTI Study--Land Imprinting	9	72
22. ACTI Study--Aerial Seeding of Forests	6	108
23. India--Workshop on Post-Harvest Food Conservation	9	126
24. Sri Lanka--Workshop on Post-Harvest Food Losses	8	144
25. Discussion Seminar--Review of Research Priorities within Foreign Assistance Programs	15	45
26. ACTI Report--Producer Gas for Motor Transport	16	231
27. Mauritania--Panel for Mauritania National Environmental Conference	5	100
28. Discussion Seminar--Appropriate Technologies for Health Care Delivery	16	140
29. Follow-Up to ACTI Projects on Traditional Village Resources	--	--
30. Discussion Seminar--Review of Future Directions of A.I.D.'s DS/ST	10	30
31. Feasibility Meeting--Study on Catalytic Oxidation	21	72
32. Feasibility Meeting--Study on Vegetable Oils as Diesel Fuels	26	57
33. Discussion Seminar--Two-Way Communications for Rural Health Services in LDCs	13	225
34. Nepal Workshop	11	165
35. Morocco Workshop	7	105
36. Discussion Seminar--Conventional Energy Training	12	36
to ber Ghana--Workshop on Research Management for Development Planning	5	75
37. Discussion Seminar-- Rem.Sens., Forestry; & Env. & Nat. Rsrcs.	<u>4</u>	<u>12</u>
TOTALS, 10/01/77 - 3/31/81	409	4296

total Value of Contributed Time: 4296 days @ \$195/day
 (Applicable A.I.D. Consulting Fee) = \$837, 720
 196 days = 16.52 manyears

total exceeds 320 since 89 participants, or 28% have served
 on more than one project.

Areas of Specialization of Participants

Aeronautics	2	Fisheries	7
Agricultural Economics	7	Food Science & Technology	12
Agriculture	5	Forestry	19
Agronomy	9	Horticulture	3
Animal Sciences	18	Hydrology & Water Mgt.	5
Anthropology	3	International Relations	1
Biology	3	Land Reclamation	1
Botany	6	Medicine	16
Chemistry		Meteorology	1
Biochemistry	3	Microbiology	4
Chemistry	7	Nutrition	5
Geochemistry	1	Oceanography	1
Inorganic Chemistry	1	Physics	
Organic Chemistry	8	Physics	8
Physical Chemistry	6	Nuclear Physics	3
Total Chemistry	26	Total Physics	11
Crop Ecology	2	Pharmacy	1
Economics	19	Plant Pathology	1
Education	15	Plant Physiology	2
Energy	10	Political Science	1
Engineering		Public Administration	4
Agricultural Eng.	10	Public Health	17
Chemical Eng.	4	Rancher	1
Civil Eng.	4	Range Science	5
Electrical Eng.	7	Remote Sensing	1
Engineering	19	R & D Management	7
Fuels Eng.	1	Rural Development	1
Industrial Eng.	1	Science Policy	7
Mechanical Eng.	12	Small Industry	2
Sanitary Eng.	4	Sociology	8
Total Engineering	62		
Entomology	2		
Environmental Science	10		
Epidemiology	1		

Areas of Specialization of Participants (Contd.)

Soil Science	6
Transportation	1
Tropical Agriculture	1
Urban & Regional Planning	10
Veterinary Medicine	7
Waste Water Technology	3

BOSTID Staff Qualification Summary

<u>Position</u>	<u>Specialties</u>	<u>Degrees</u>	<u>Geographic Specialty</u>	<u>Years Experience Living Overseas</u>	<u>Years Experience With International Programs</u>
Director	Zoology, International Relations	Ph.D.			15
Dep. Director	Biochemistry	Ph.D.	Africa	11	24
Dep. Director	Biological Science Urban Affairs	B.S. M.S.	Asia	7	16
Prof. Assoc.	Chemical Engineering Public Administration	B.S. M.A.	Latin America Egypt	2	18
Prof. Assoc.	Geography	Ph.D.	Middle East Islamic Africa	6	19
Prof. Assoc.	Law and Diplomacy International Relations	M.A.L.D. M.A.			12
Prof. Assoc.	Industrial Chemistry	M.S.			12
Prof. Assoc.	Organic Chemistry	Ph.D.		Raised in New Zealand	13
Prof. Assoc.	Photo Chemistry Biology	Ph.D. B.S.	Asia North Africa	8	13
Prof. Assoc.	International Affairs Economics, Development	B.A. M.A.	Africa India	4	21
Prof. Assoc.	Science and Technology Information and Communication Systems	M.A. B.A.	Latin America Western Europe	1	18
Prof. Assoc.	Public Health	Lic. M.P.H.	Latin America	5	7

BOSTID Staff Qualification Summary

<u>Position</u>	<u>Specialties</u>	<u>Degrees</u>	<u>Geographic Specialty</u>	<u>Years Experience Living Overseas</u>	<u>Years Experience With International Programs</u>
Prof. Assoc.	Physics Technology Transfer	Ph.D. M.S. B.E.P.	Latin America	1	7
Prof. Assoc.	Chemistry	Ph.D. B.S.	Latin America	3	5
Asst. to Director	Business Administration Asian Studies		Asia Middle East	10	30
Staff Assoc.	Political Science Accounting	B.A.	Asia	2	13
Staff Assoc.	Radio, Television & Film	B.A.		0	7
Staff Assoc.	Accounting				6
Editor	English Literature	B.A.			6
Publ. Coord.	Art History	B.A.		2	5
Librarian	French, History Library Science	B.A. M.L.S.		2	2
Writ., Res. Asst.	Writing	B.A.	Africa	10	8
Staff Asst.	History Library Science	B.A.			10

July 1980

DISTRIBUTION BY GRADE OF
BOSTID PROFESSIONAL STAFF

<u>Grade</u>	<u>Salary Range</u>	<u>No. of BOSTID Staff</u>
PG I	\$13,000 - \$21,000	2
PG II	\$16,000 - \$28,500	1
PG III	\$22,000 - \$39,000	6
PG IV	\$28,500 - \$47,500	12
PG V	\$35,000 - \$55,000	1
PG VI	\$42,000 - \$60,000	0
		<hr/>
		22

Primary Affiliation of Participants

<u>Government</u>	<u>Academic</u>	<u>Industry</u>	<u>Other</u>
70	158	53	53

(Total exceeds total of participants since some participants have overlapping affiliations)

Experience in Developing Countries

<u>Latin America</u>	<u>Middle East</u>	<u>Africa</u>	<u>Asia</u>
91	36	64	102

(Many participants have experience in more than one developing country)

Age

<u>Under 35</u>	<u>35 - 49</u>	<u>50 - 65</u>	<u>Over 65</u>
31 9%	118 36%	149 46%	25 8%

Sex

<u>Male</u>	<u>Female</u>
307 95%	16 5%

(Bureau of Labor Statistics figures for 1977 show that 15.6% of all persons employed in the life and physical sciences are female)

Race

<u>Black</u>	<u>Hispanic</u>	<u>Asian</u>	<u>Caucasian</u>
6 2%	7 2%	17 5%	293 91%

Total number of racial minorities = 30 (10%)

(1977 BLS figures show 8.7% of persons employed in the life and physical sciences are racial minorities, 3.1% in the social sciences)

Project	Direct	Approximate	Subtotal	Indirect	Total
	Costs	Staff Costs	NAS Costs	NAS Costs*	NAS Costs
	(NAS)	(NAS)			
ACTI					
Administration	\$ 68614	\$ 74800	\$ 143414	-	\$ 143414
Water Buffalo (staff cost only)		82200	82200	38283	120483
* Winged Bean—new edition	10/198	10000	20198	38283	58481
0 Fees mtg—EPRD supplement	13/16	10000	11346	38283	49629
2 * Productive Utilization/Wastes	38610	60000	98610	38283	136893
5 * Alcohol Fuels	8909	60000	68909	38283	107192
7 EPRD Supplement	45863	20000	65863	38283	104146
1 * Revegetating the Range	4780	27400	32180	38283	70463
2 Aerial Seeding	10978	74800	85778	38283	124061
9 * Producer Gas	8371	57400	65771	38283	104054
Report Reprints	62099	-	62099	-	62099
8 * Report Reprints	88153	-	88153	-	88153
Subtotal, ACTI	\$ 347921	\$ 516600	\$ 864521	\$ 344547	\$ 1209068
Program Development (general)	\$ 63536	\$ 179200	\$ 242736	\$ 25334	\$ 268070
Follow-up & Implementation					
9 ACTI—Village Resources	\$ 1257	\$ 4350	\$ 5607	\$ 390	\$ 5997
General	66490	270000	336490	21959	361449
Subtotal, Follow-up	\$ 67747	\$ 274350	\$ 342097	\$ 25334	\$ 367431
Evaluation					
9 Brazil Chemistry (staff cost only)	-	\$ 20000	\$ 20000	\$ 1682	\$ 21682
4 General	\$ 6767	200000	206767	18587	225354
Subtotal, Evaluation	\$ 6767	\$ 220000	\$ 226767	\$ 20269	\$ 247036
Board Support	\$ 41896	\$ 150000	\$ 191896	-	\$ 191896
Administration	\$ 6054	\$ 494011	\$ 500065	-	\$ 500065
Totals	\$ 958737	\$ 2416261	\$ 3375000	\$ 1101388	\$ 4476388

Time Contributed by NAS	Time Contributed by NAS		Time Contributed by Cooperating		
	Participants		Country (Days)		
	No. of Days	Value**	Participants	Staff	Total
	140	27300			
	332	64790			
	25	4875			
	16	3120			
	337	65715			
	273	53235			
	9	1755			
	111	21645			
	100	21060			
	231	45445			
	1582	\$ 308490			
	90	17550	180	132	312
	99	8580	132	66	198
	50	9750	308	48	356
			440	114	554
	690	131550			
	4975	\$ 772625	4300	1250	5548

* Production costs for these ACTI reports will be charged to Grant No. DAN-5538-G-SS-1023

Report reprint costs (letter of agreement No. 38) were charged to Contract AID/ta-C-1453 in

9/30/77 - 3/31/8;

Project	Direct	Approximate	Subtotal	Indirect	Total,
	Costs	Staff Costs	NAS Costs	NAS Costs*	NAS Costs
	(NAS)	(NAS)			
Overseas Programs					
Cameroon Workshop	\$ 21996	\$ 30000	\$ 51996	\$ 28712	\$ 80708
Philippines Workshop	20694	40000	60694	28712	89406
Sudan Workshop	30660	40000	70660	28712	99372
Caribbean Regional Meeting	10015	15000	25015	28712	53727
Costa Rica Workshop	33186	40000	73186	28712	101898
Jordan Advisory Panel	18762	30000	48762	28712	77474
India Workshop	38753	40000	78753	28712	107465
Sri Lanka Workshop	28807	40000	68807	28712	97519
Mauritania Workshop	27121	40000	67121	28712	95833
Ghana Workshop (staff cost only)	-	40000	40000	28712	68712
Morocco Workshop	17967	40000	57967	28712	86679
Nepal Workshop	56293	40000	96293	28712	125005
Report Reprints	3583	-	3583	-	3583
Subtotal, Overseas Programs	\$ 307119	\$ 435000	\$ 742119	\$ 344544	\$ 1086663
Special Studies/Advisory Panels					
Disc Sem--Fast Growing Trees	\$ 300	\$ 2500	\$ 2800	\$ 16890	\$ 19690
French Trans Resource Sensing	11130	11800	22930	16890	39820
Disc Sem--Middle East S&T	3150	8700	11850	16890	28740
Disc Sem--Urban Problems	2340	13700	16040	16890	32930
Disc Sem--New Mechanisms	3214	17400	20614	16890	37504
Disc Sem--Revegetation	3054	10000	13054	16890	29944
Feas mtg--WS Energy Survey Meth	1227	-	1227	16890	18117
Disc Sem--Resch Priorities	3177	10000	13177	16890	30067
Disc Sem--App Tech Health Care	4399	10000	14399	16890	31279
Disc Sem--AID/DS/OST	2303	10000	12303	16890	29193
Feas mtg--Catalytic Oxidation	2412	10000	12412	16890	30302
Feas mtg--Vegetable Oils	4456	10000	14456	16890	31346
Disc Sem--2-way Comm/Rural Health	6748	10000	16748	16890	33638
Disc Sem--Conv Energy Training	2669	10000	12669	16890	29559
Disc Sem--Forestry & Nat Res.	1572	10000	11572	16890	28462
Subtotal, Special Studies/					
Advisory Panels	\$ 56916	\$ 147100	\$ 203516	\$ 253354	\$ 456870

Project	Time Contributed by NAS		Time Contributed by Cooperating		
	Participants		Country (Days)		
	No. of Days	Value	Participants	Staff	Total
Cameroon Workshop	90	17500	11	60	330
Philippines Workshop	96	19720	283	89	372
Sudan Workshop	126	24570	378	85	463
Caribbean Regional Meeting	63	12395	139	81	220
Costa Rica Workshop	100	23100	360	89	449
Jordan Advisory Panel	50	9750	150	66	216
India Workshop	126	24570	378	85	463
Sri Lanka Workshop	99	20097	332	85	417
Mauritania Workshop	100	19500	310	81	391
Ghana Workshop (staff cost only)	75	14625	125	81	306
Morocco Workshop	165	32075	380	86	466
Nepal Workshop	105	20975	340	81	421
Report Reprints					
Subtotal, Overseas Programs	1280	\$ 245700	3670	1012	4702
Disc Sem--Fast Growing Trees	2	390			
French Trans Resource Sensing					
Disc Sem--Middle East S&T	28	5160			
Disc Sem--Urban Problems	42	8170			
Disc Sem--New Mechanisms	30	5850			
Disc Sem--Revegetation	26	5070			
Feas mtg--WS Energy Survey Meth	19	2730			
Disc Sem--Resch Priorities	45	8775			
Disc Sem--App Tech Health Care	140	27300			
Disc Sem--AID/DS/OST	30	5850			
Feas mtg--Catalytic Oxidation	72	14070			
Feas mtg--Vegetable Oils	57	11115			
Disc Sem--2-way Comm/Rural Health	225	43875			
Disc Sem--Conv Energy Training	34	7020			
Disc Sem--Forestry & Nat Res.	12	2310			
Subtotal, Special Studies/					
Advisory Panels	754	148005			

35

NOTES:

*Allocable portion of Board support, administration, evaluation, program development, and follow-up costs. 62% of Board support, administration, plus 31% of evaluation, have been allocated to contracts other than Contract AID/5a-C-1433.

**Value of time contributed by NAS participants calculated at \$195/day.

Column 1 (Direct Costs): Travel (domestic and international), communications and shipping, materials and services, and general and administrative costs associated with these expenses.

Column 2 (Approximate Staff Costs): Approximate staff costs, including salaries, fringe benefits, and obligatory NAS overhead and general and administrative costs.

Approximately 975 persons have been involved in BOSTID programs under contract AID/ta-C-1433, including panelists, contributors and research contacts for studies, report reviewers, and other participants such as those at discussion seminars.