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Annual Budget Submission

FY 1985

OFFICE OF THE SCIENCE ADVISOR

MAY 1983

Agency for International Development
Washington, D.C. 20523

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I. Office Narrative Statement

A. Overview

Since the beginning of the SCI program in FY 1981, we have obligated $32 million, funded 125 research projects directly (or indirectly through the National Academy of Sciences), and supported research in 38 developing countries. But before we delve into the program itself, it may be useful to review our special mandate and how we articulate with the broader AID thrust of research and development.

In FY 1981, Congress established a new Program for Scientific and Technological Cooperation to encourage AID to take a more innovative and collaborative approach to the problems and processes of development research and technology transfer. The funds provided were in addition to those made available for research and technical assistance under other AID accounts. The mandate included both research to explore the potential uses of the emerging technologies for development and innovative approaches to strengthen the capacity of less developed countries to take advantage of these new technologies. (Since FY 1982, there has been an earmarking of Section 106 funds for this program under the Continuing Resolution).

The SCI research program recognizes that many of the innovative and emerging technologies used in one sector are equally useful in other sectors. Therefore, the program tries to identify the more promising categories of new technologies which cut horizontally across Agency sector priorities in order to give the broadest potential exposure and application of these technologies to future programs of technology transfer. We emphasize the natural and physical sciences since historically these tend to have been somewhat neglected in AID bilateral programs. We also fund a small number of studies and workshops to identify important new areas of science and technology and to involve U.S. and LDC scientists, together with AID professionals, in the discussion of research priorities in these areas. For example, last year's conference in biotechnology held under the auspices of the National Academy of Sciences (NAS) considerably boosted the interest in applying biotechnology to development on the part of private industry, LDC institutions, the S&T Bureau as well as SCI.

However, our mandate is broader and more complex than simply to support innovative science. We are asked to do this in the context of strengthening the capacity of less developed countries to take advantage of these new technologies. We believe that a cluster of definitive, scientifically sound, and relevant research projects is the best way to develop LDC experience with these technologies.

Therefore, we admit a strong preference for proposals submitted by LDC scientists. In fact, we often tell U.S. scientists that the chances of cooperative proposals, which involve both U.S. and LDC institutions, being funded increase considerably if the final proposal actually comes directly from the participating LDC scientist's institution. In addition, for U.S. proposals where the research will be carried out mainly in the U.S., we seek evidence of meaningful LDC scientist participation. For example, we ask that LDC scientists be recruited to fill research assistant positions where this is appropriate.

The insistence on good quality science from an LDC scientist is essential to the development of his utility to his country's development needs. Historically, AID has not always insisted on firm quality control of local research efforts. This history partly explains why LDC scientists with good credentials have often submitted substantively inadequate proposals to SCI. During our field visits, local scientists often remark that they initially considered us just another donor agency program and thus submitted documents that extolled the benefits of the research rather than focusing on the content of the research itself. When they learned that experienced scientists in peer review panels, not budget officers, would make the recommendations on scientific merit, they responded enthusiastically and with much more detailed technical proposals.

We are also interested in helping less-experienced LDC scientists. In the NAS grants program, staff or collaborating scientists visit all researchers and often assist in revising proposals. Moreover, regular meetings of researchers in each network, with the participation of U.S. colleagues, provide peer assistance to younger and less experienced researchers. Similarly, if LDC proposals under the competitive grants program reach the stage at which a scientific review panel thinks highly of the idea but concludes that the principal investigator needs help in finalizing the research plan, we send a private sector consultant to advise the LDC researcher on how he might make his proposal more competitive. (Section IV contains a letter report which shows how valuable this assistance can be when a poorly written proposal camouflages a good scientist and a good research design.)

Our genuine interest in both new ideas and LDC scientists has given us credibility among AID field missions. To them, our resources represent an opportunity for mission involvement in areas and with institutions that hold promise for future program development, but which may not fit within their most urgent operational budget priorities. We have projects operating in 38 countries, as shown in Table A. All of the NAS subgrants and over half of the nearly 700 proposals that we received for funding consideration in FY 1984 under the competitive grant program were from LDC scientists. The latter

TABLE A

Region/Countries	Number of Projects: Competitive Program	Number of Projects: NAS Networks
AFRICA		
Botswana	1	
Cameroon	1	
Congo		1
Kenya		4
Lesotho	1	
Liberia	1	
Malawi	1	1
Senegal	2	
Sierra Leone	2	
Somalia	1	
Sudan		1
Togo	1	
Zambia	1	
subtotal	12	7
ASIA		
Burma	2	
India	2	
Indonesia	3	1
Malaysia		1
Nepal	8	
Pakistan		1
Philippines	5	1
South Pacific	1	
Sri Lanka	4	
Thailand	5	5
subtotal	30	9
LAC		
Bolivia	2	
Brazil	2	1
Caribbean Reg.	5	
Chile		2
Costa Rica	1	
Dominican Republic	1	
Ecuador	2	
Guatemala	4	2
Honduras	2	
Jamaica	2	
Mexico	1	2
Panama	1	1
Peru	4	1
subtotal	27	9
NE		
Egypt	1	
Tunisia	1	
subtotal	2	
TOTALS	71	25

Note: Excludes worldwide projects. Three projects operate in 2-3 countries each.

came to us through AID missions. In FY 1984 we expect that at least half of our competitive grant resources will go to LDC institutions. In contrast, we understand that only about 20% of the remaining Agency research funds go to LDC institutions.

B. Basic Elements of Program

During our first year of operation in FY 1981, our program seemed to some to consist only of a large, controversial grant to the National Academy of Sciences and an unfocused, staff-intensive small grants competition. There appeared to be little strategy to explain the allocation of resources. During FY 1982 and early FY 1983, we worked closely with the S&T Bureau, the Sector Councils, and regional bureau staff to identify the functions that our modest resources could best perform while the Agency itself was going through the throes of establishing research priorities, issuing new sector policy and strategy statements, and developing bureau-level long-term strategies. The results of these collaborative discussions have been quite significant:

-- the annual funding of the NAS grant was significantly reduced, and its focus narrowed from general interest in science and technology activities to specific concern for six highly selected research topics. The grant size was left intact, but was extended from five to eight years to accommodate the longer lead times of a more targeted research program.

-- meanwhile, the SCI-managed competitive grants program developed five delimited areas of primary focus (Research Modules).

The following outline highlights the elements of the SCI strategy:

Objectives:

-- Take the lead in identifying and investigating innovative technologies which hold longer-term promise for future AID programs of technology transfer.

-- Provide LDC scientists with regular opportunities to gain first-hand experience with these newer technologies.

-- Support and strengthen field mission efforts to place greater emphasis on science and technology in their programs.

-- Serve as a limited source of funding for truly innovative ideas which may not always conform to the more vertical sectoral Agency priorities.

-- Promote cooperation between U.S. and developing country scientists in these innovative areas.

Strategy:

-- Focus on new and innovative scientific approaches that tend to cut horizontally across Agency sector priorities to give broadest potential exposure and application to technology-based development.

-- Focus both on an openly competitive approach to stimulate maximum participation among scientists in the program as well as on a network approach, with the latter targeted on the needs for many LDC institutions to have intensive interaction and support from more experienced U.S. scientists.

-- Under each approach, concentrate resources on a specifically limited number of areas in order to approach a critical mass of research on a common technology and to test the feasibility and utility of the technology.

-- Emphasize the natural and physical sciences.

-- Limit awards in the range of three years and $150,000 each, since the program aims at the preliminary investigation of an idea, not its full development, program funds are scarce, and this amount really represents rather considerable resources to an LDC institution.

-- Consider the grants competition as a means for encouraging LDC scientists to indicate the specific areas that appear to them to have the most potential from their perspective.

-- Sponsor a small number of studies, workshops, and briefings to help AID identify and assess future innovations in S&T.

Program Components:

-- Competitive Research Grants Program: funds 40-50 projects a year totalling $6 million, principally in five Research Modules:

  -- 1. Biotechnology related to health (human and animal)

  -- 2. Biotechnology in the plant sciences

  -- 3. Chemistry for World Food Needs

  -- 4. Biomass Resources and Conversion Technology

  -- 5. Biological Control of selected tropical diseases and their vectors

There are also four secondary Research Modules (Pre-Modules) for possible future development; (1) engineering technology, (2) earth sciences, (3) marine sciences, and (4) genetic resources.

Two projects fund this program element: Innovative Science Research Project (936-5542) and the Strengthening S&T Capacity Project (936-5543). The published guidelines of the program, and a listing of the proposals funded to date in FY 1983 are contained in Section IV of the ABS.

-- LDC Research Networking: this is implemented primarily under an eight year grant with the National Academy of Sciences (NAS) which is funded incrementally at $4 million per year. The grant currently supports research in LDCs only within six areas:

-- 1. Grain amaranth

-- 2. Biological nitrogen fixation

-- 3. Fast-growing, nitrogen-fixing trees

-- 4. Mosquito vector field studies

-- 5. Rapid epidemiolgical assessment

-- 6. Causes of acute respiratory diseases in children.

Each area funds grants to 9-12 institutions as well as the networking costs to share their experiences, research designs, and to obtain training from more experienced U.S. or other LDC scientists. All research is carried out by LDC institutions. The research subgrants generally are in the $100,000-$125,000, and range for two to four years. The grant also supports research-related studies and workshops aimed at developing future scientific agenda topics for funding under the grant or for AID to consider funding separately. During FY 1983, there has been an effort to coordinate the competitive grants program with NAS wherever a U.S. research proposal might make a valuable contribution to the work being supported under the LDC research networks.

Table B contains a chart which compares the elements of the competitive grants program and the LDC research networking program.

Material on the 1983 program is contained in Section IV.

TABLE B

Agency for International Development

OFFICE OF THE SCIENCE ADVISOR

Competitive Research Grants
USAID/SCI

4 Research Modules

- biotechnology
- chemistry for world food needs
- biomass resources and conversion technology
- biological control (schistosomiasis, malaria, insect-borne plant viruses)

4 Research Pre-Modules: engineering technology, earth sciences, marine sciences, genetic resources

Preproposals - USAID Missions
AID/Washington
U.S. investigators

Full Proposals (invited) - Science Advisor
- Agency Sector Councils

Peer Review - scientific merit
- relevance to development
- innovation
- LDC capacity building

AID Management - USAID Missions
AID/W Regional Bureaux
AID/W S&T Bureau

Funding: $6 million annually

National Academy of Sciences
Board on Science & Technology for International Development (BOSTID)

6 Approved Research Areas

- grain amaranth
- biological nitrogen fixation
- fast growing, nitrogen fixing trees
- mosquito vector field studies
- rapid epidemiological assessment
- causes of acute respiratory diseases in children

Workshops → Approved Areas

BOSTID staff visits + advisors

Invited Applications (LDC only)

Peer Review - Committe on Research Grant

Networking Workshops

Funding: $36 million over 8 years

C. Impact/Evaluation

Our first research grant was signed August 31, 1981. The first final research report is due June 30, 1983. The focus of that report will be on the feasibility of using microcomputers to meet LDC statistical processing needs. Through the rosy lens of the retrospectroscope, this report looks indeed very timely today. A year and a half ago the Agency had not yet focused systematically on its future role in meeting LDC requests for small computers. Often timely ideas have to be tried before a complex institution like AID can decide if and where the idea fits into its overall planning.

We are planning an evaluation of our program in FY 1985. The scope of work will focus both on the content of our programs and on related process. We propose to invite the newly constituted Research Advisory Committee to participate in this evaluation. It is obviously too early to judge the content of our program, but some observations can be made regarding the process.

We see AID field missions as our primary client. Regardless of the size of their budgets, their source of appropriation, or the limitations of their staff, the missions must become increasingly involved with local research institutions in technology development and adaptation if one of their principal program objectives is technology transfer. We come into their planning cycle before they have to commit resources to a new project idea or even a new sector of activity. In many cases, where mission budgets appear locked in for two to three years, our modest resources are also seen as a means for mission technicians to keep their lines of communication open to promising local researchers who currently do not participate in the bilateral program. For example, one mission director recently indicated that our program is providing particularly useful LDC - US scientist linkages and insights into some of the issues that will have to be addressed in a proposed FY 1985 major new science and technology initiative.

From the viewpoint of scientific content, we recognize the need to concentrate our resources to fund enough research to test the early feasibility and usefulness of new and innovative technologies. Yet the recent narrowing of program focus to the Research Modules has been accompanied by a near doubling of the preproposals with increasing percentages of proposals from LDC scientists both overall and within the Module areas. As a result of this response, we propose to divide the biotechnology Research Module into two areas, one for health (human and animal) and one for plant sciences.

Beginning in FY 1984, this demand in our Research Modules reduces considerably the amount of flexibility we have to respond to outstanding LDC submissions that fall within the Pre-Module areas. For example, one of our most interesting

projects in FY 1983 is the joint private/university sector development of a high gradient magnetic separation pilot plant for the mining of tin ore in Bolivia. This effort had originally been supported by a grant from the National Science Foundation to test the concept in a laboratory at M.I.T. A local university and a subsidiary of Allis Chalmers will carry on the work in Bolivia. Testing the practical feasibility of the concept requires the operation of a full-scale pilot plant at a mine site. If succcessful, the mission feels that this research will have made a significant contribution to Bolivia's mining industry. We think the highly selective ability to continue to respond to outstanding mission-supported proposals remains important no matter how limited our resources.

By FY 1985, we believe that our competitive research grants process will be able to generate annually at least $4-5 million of highly relevant proposals of good scientific merit involving LDC scientists. But we will not have the resources or mandate to fund them. We believe that the regional bureaus should examine our process and see if it could be used in their own efforts to increase mission participation in the Agency research priority program.

In a manner analogous to other research agencies, our office appreciates the merit of consistently using external scientific peer review panels as part of the funding-decision process. We have found that such peer panels enable missions with very limited technical expertise to submit interesting proposals based on relevancy and essentially to delegate the function of determining scientific merit. The panels also provide us expertise that does not exist in AID to evaluate the newer technologies. Since we are an office with horizontal research priorities, the panels offer us extremely useful guidance in selecting the best proposals from among competing sector priorities.

One of our initial assumptions -- that other offices would be able to pick up our best research for full development -- must be modified. Two project managers of very innovative projects already have advised us that their principal investigators may have accomplished some very useful work by the time their grants end later this year. Yet it does not now appear that there could be any follow-up support from other AID offices until FY 1985 or FY 1986. Nor does it seem that the grantees will be able to build upon their research without additional external support. The AID budget process leaves quite a time gap between determining that one of our projects has produced something useful and another technical office being able to build on that effort. We are prepared to consider a joint follow-on project where we agree to pick up a modest level of continuing support until the year another AID partner has budgeted funds to continue the development effort.

We had been concerned that our need to develop a program quickly might leave us outside the mainstream of AID research priorities. Our approaches, which emphasize intersectoral technologies and broad LDC scientist participation, have produced a remarkable congruence between the SCI Research Modules and the NAS program of activities, on the one hand, and the content of the four Agency research priorities (excluding contraception research), on the other.

We also believe that missions will in many instances find that the research we support will make excellent candidates for their participation in the Agency research prioritization program, particularly in areas such as biotechnology, genetic resources, and marine sciences.

D. Program Management

The Office has the necessary staff of four scientists with a broad range of scientific backgrounds to carry out its programs. Their fields include: biomedical research, biochemical research including both nutrition and agriculture, physical sciences, and electronics and information systems. Two of these officers occupy ceilings that are not yet assigned to us. One ceiling is being transfered to us from the S&T Bureau. The other falls under the "E'ed" category but critically enables us to employ the only professionally trained peer review manager in the Agency.

The Office must and indeed wishes to continue to rely on other offices to manage the portfolio funded under the competitive research grants program. However, the acquisition of an IBM/PC computer now enables us to monitor on behalf of project managers, both in Washington and in the field, administrative actions under the projects, including direct correspondence with principal investigators to remind them of reports due, to query regarding the status of special actions such as determining the need for a vehicle waiver, and to check whether the date for a workshop still remains valid. Thus, on behalf of project managers, we are better able to anticipate when grant actions are due.

The Office also has agreed to continue to be responsible for handling any amendments, waivers, or other actions affecting the terms and conditions of grants issued in Washington, thereby further lightening the administrative load of AID/W managers. For the field, the Office has begun to assume some technical backstop responsibilities when a mission wants a project but does not have the on-board expertise to monitor it technically.

We continue to depend on the S&T Bureau for very valuable administrative and program office support. This includes the critically important detail of a full-time senior program officer.

E. Justification for Table V Rankings.

The office proposes to continue to fund all its activities through its existing three projects. As they currently function, they permit apppropriate flexibility in considering new ideas for funding. The Innovative Scientific Research and the Strengthening S&T Capacity in LDC's Projects operate as PVO basket-type projects where each sub-activity is approved separately.

The first funding increment will provide $1 million for each of the five Research Modules under the competitive grants program and $.5 million to proposals qualifying under the pre-Modules. All proposals will be fully funded.

The second increment, which will represent 67% of that year's expenditures under the NAS grant, will fund the grant through December 1986. This grant had high front loading in the early years, thus enabling a shift of resources to the competitive research program as the latter gathered momentum. This increment brings forward-funding of the NAS grant down to 15 months.

The third increment represents various mechanisms for providing support to LDC scientists. About $100,000 of this amount represents the costs of U.S. consultants to strengthen the research design of LDC proposals. $55,000 will continue core support to the fellows program of the American Association for the Advancement of Science (AAAS). Through this core support, we fund one fellow and AID's share of the costs of interviewing the candidates. We expect other AID offices to assume the costs of three to four additional fellows for assignment to their areas. The balance of these funds will cover proposals submitted under the competition but which are not individual research projects themselves.

The last increment would permit us to do two things: (1) participate in joint research projects with other AID offices to continue the work of the most promising SCI-completed projects until the other offices can assume the funding, and (2) modestly expand the resources for outstanding research ideas which extend somewhat beyond the Research Modules into promising new areas.

TABLE V - FY 1985 PROPOSED PROGRAM RANKING
05/17/83

OFFICE 015 ST/SA

RANK	DECISION PACKAGES/PROGRAM ACTIVITY		TERM/ NEW/ CONT	LOAN/ GRANT	APPROP ACCT.	PROGRAM FUNDING ($000) INCR	CUM	ITEM
	DECISION PACKAGE - PROPOSED (50)							
1	9365542	INNOVATIVE SCIENTIFIC RESEARCH	C	G	SL	5500	5500	3746
2	9365538	APPLYING S AND T TO DEVELOPMENT	C	G	SD	4000	9500	3747
3	9365543	STRENGTHENING S+T CAPACITY	C	G	SD	500	10000	3748
4	9365542 *	INNOVATIVE SCIENTIFIC RESEARCH	C	G	SL	1000	11000	3749

TABLE III - PROJECT OBLIGATIONS BY APPROPRIATION ACCOUNT
FY 1983 TO FY 1985 ($ THOUSANDS)

OFFICE: ST/SA

APPROPRIATION ACCOUNT - SD

PROJECT#	PROJECT TITLE	FY 1983 OYB-REVISED	FY 1984 REVISED	FY-85 PROPOSED
936-5528.	APPLYING S AND T TO DEVELOPMENT	$5,000	$4,000	$4,000
936-5542.	INNOVATIVE SCIENTIFIC RESEARCH	$4,850	$5,500	$6,500
936-5543.	STRENGTHENING S+T CAPACITY	$150	$500	$500
TOTALS FOR SD		$10,000	$10,000	$11,000
* * OFFICE TOTAL:		$10,000	$10,000	$11,000

PROJECT NUMBER AND TITLE	G L	OBLIG DATE INIT	OBLIG DATE FIN	TOTAL COST AUTH	TOTAL COST PLAN	OBLIG THRU FY 82	FY 82 PIPE-LINE	FY 1983 OBLIG-ATIONS	FY 1983 EXPEND-ITURES	FY 1984 OBLIG-ATIONS	FY 1984 EXPEND-ITURES	FY 85 AAPL	FUNDED THRU	FY 86 OBLIG	FY 87 OBLIG	FY 88 OBLIG	FY 89 OBLIG	ITEM
SELECTED DEVELOPMENT ACTIVITIES																		
9365538 APPLYING S AND T TO DEVLPMNT (NAS) - I SUBCAT: TECHNICAL CODE:																		
	G	81	87	36000	36000	13000	8113	5000	5000	4000	6000	4000	1286	4000	4000	2000	---	5
9365542 INNOVATIVE SCIENTIFIC RESEARCH SUBCAT: TECHNICAL CODE:																		
	G	81	C	---	---	7055	5715	4850	4000	5500	5000	6500	0985	7500	7500	7500	7500	5
9365542 STRENGTHENING S AND T CAPACITY SUBCAT: TECHNICAL CODE:																		
	G	81	C	---	---	1621	1086	150	800	500	600	500	0985	500	500	500	500	5
APPROPRIATION																		
TOTAL				36000	36000	21676	14914	10000	9800	10000	11600	11000		12000	12000	10000	8000	
GRANT				36000	36000	21676	14914	10000	9800	10000	11600	11000		12000	12000	10000	8000	
LOAN				---	---	---	---	---	---	---	---	---		---	---	---	---	
PROGRAM																		
TOTAL				36000	36000	21676	14914	10000	9800	10000	11600	11000		12000	12000	10000	8000	
GRANT				36000	36000	21676	14914	10000	9800	10000	11600	11000		12000	12000	10000	8000	
LOAN				---	---	---	---	---	---	---	---	---		---	---	---	---	

PROGRAM:

ACTIVITY DATA SHEET

PROJECT MANAGER:

TITLE	FUNDS	PROPOSED OBLIGATION (In thousands of dollars)		
Applying Science and Technology to Development	Sel. Dev. Problems - S&T	FY 85 4,000		LIFE OF PROJECT 36,000
NUMBER 936-5538 GRANT ☒ LOAN ☐ / NEW ☐ CONTINUING ☒	PRIOR REFERENCE Annex V, P. 150	INITIAL OBLIGATION FY 81	ESTIMATED FINAL OBLIGATION FY 88	ESTIMATED COMPLETION DATE OF PROJECT FY 88

Purpose: To identify underexploited technologies of potential economic value to developing countries and fund networks of developing country research institutions to explore and improve these technologies.

Background and Progress to Date: This project takes advantage of the extraordinary scientific resources of the National Academy of Sciences (NAS) to formulate a program of research, workshops, conferences, studies, and publications to carry out the project purpose. As a result of an extensive AID/NAS review in 1982, the project now focuses predominantly on research. In addition, in order to develop a critical mass on the research areas addressed under the project, the NAS will concentrate its subgrant program in six areas rather than in 12 as had been previously planned. As a matter of policy, research funds are awarded only to scientists in developing countries.

Research networks are being supported in the following areas: grain amaranth, a plant whose small seeds have a high content of good quality protein; biological nitrogen fixation with special emphasis on developing understanding and new technologies related to underexploited tropical legumes, azolla-anabaena systems, and free-living or associative nitrogen-fixing bacteria; mosquito vector field studies that may lead to the development of sound control strategies for the reduction or prevention of diseas; rapid epidemiologic assessment to emphasize research oriented toward development, adaptation, and testing of simplified epidemiologic techniques for use in connection with public health programs in developing countries; fast-growing, nitrogen-fixing trees, including inventorying native species and comparative field testing of selected species ; and diagnosis of acute respiratory infection in children.

The studies focus on innovative applications of technologies relevant to major development to major development problems. These reports bring together the latest information on the state-of-the-art specific work under way on a topic. They are a potential source of research areas for support under the grant. Examples include studies on the potential of alcohol fuels, the winged bean, firewood crops, and grain amaranth.

Conferences and workshops are also aimed at identifying research areas. Examples include 1) a major international conference (July 26-30, 1982) on applications of biotechnology to development, which defined priorities for research in health, agriculture and energy applications likely to pay off in five to ten years; 2) a workshop (September 29 - October 2, 1982) on the biology of insect vectors of animal and human diseases, with specific reference to research and training needs, and 3) a meeting (June 16-19, 1982) on technology for the control of guinea worm disease, a painful and disfiguring malady affecting millions in Africa and Asia, which has received all too little attention from the world's scientific communit

Host Country and Other Donors: Host country counterparts will contribute to wo shops and research. The U.S. scientific community is also expected to donate s vices and advice. Complementary funds from the private sector and other donors have already been received and will continue to be sought.

Beneficiaries: Researchers and S&T policy makers in LDCs working on developmen problems keyed to improving the status of the poor inhabitants of their countri will be the immediate beneficiaries. Ultimate beneficiaries will be the poor whose lives will be improved by the research.

FY 1985 Program: Six on-going research networks involving over 60 LDC institut will be supported; two new studies and three new workshops will be started; and Ecuador S&T assessment will be completed.

Major Outputs:	All Years
Research Grants	100
Study Reports	13
Major Workshops	10
S&T Capacity Assessment	1
Publication Program	

AID-Financed Inputs	FY 1985 (000s)
Research sub-grants	2,000
Networking/Training	150
Publications	150
Personnel (including studies' directors)	900
Other (supplies, consultants, overhead, etc.)	800
	4,000

U.S. FINANCING (In thousands of dollars)	Obligations	Expenditures	Unliquidated	Funding Period	Principal Contractors or Agencies
Through September 30, 1982	13,000	4,887	8,113		National Academy of Sciences
Estimated Fiscal Year 1983	5,000	5,000		6/30/84-7/31/85	
Estimated through September 30, 1983	18,000	9,887	8,113		
Proposed FY 1984	4,000	6,000		8/1/85-4/30/86	
Estimated through Fiscal Year 1984	22,000	15,887	6,113		
Proposed FY 1985	4,000	Future Year Obligations	Estimated Total Cost	5/1/86-12/31/86	
		10,000	36,000		

PROGRAM: CENTRALLY FUNDED

ACTIVITY DATA SHEET

PROJECT MANAGER:

TITLE	FUNDS	PROPOSED OBLIGATION (In thousands of dollars)		
Innovative Scientific Research	Sel. Dev. Problems - S&T	FY 85 5,500		LIFE OF PROJECT (auth) 17,405
NUMBER 936-5542 GRANT ☒ LOAN ☐ NEW ☐ CONTINUING ☒	PRIOR REFERENCE Centrally funded Annex V, p. 150	INITIAL OBLIGATION FY 81	ESTIMATED FINAL OBLIGATION FY continuing	ESTIMATED COMPLETION DATE OF PROJECT FY continuing

Purpose: To encourage the expansion of innovative scientific research in support of development.

Background and Progress to Date: This project focuses on new and innovative scientific technologies that tend to cut horizontally across Agency sector research priorities. This approach offers the broadest potential exposure and application of these technologies to future programs of technology transfer. The project emphasizes the natural and physical sciences and related technologies since these tend to have been somewhat neglected in AID bilateral programs. The project currently runs on open grants competition for both LDC and U.S. scientists to submit their most promising ideas under one of the following five technology areas or "Research Modules":

Biotechnology Related to Health (human and animal), includes recombinant microbiology (genetic engineering), monoclonal antibodies and related immunological techniques for better and more rapid diagnosis, immunotherapy, and vaccine development.

Biotechnology in the Plant Sciences, includes plant tissue culture and genetic engineering for improved plant varieties and industrial applications.

Chemistry for World Food Needs, particularly biochemical growth regulation in plants and animals, soil chemistry, soil-plant-animal relationships (biochemistry), innovative food chemistry, studies of natural pesticides from plants, and the chemistry of integrated aquaculture systems.

Biomass Resources and Conversion Technology, including new and improved processes for producing fuels, fodder and chemical feedstocks from biomass, especially better digestion and use of lignocellulose, improved thermochemical cleaning and storage of producer gas, and development of underutilized (e.g. aquatic) biomass resources.

Biological Control of three groups of disease-causing microorganisms and their respective vectors, specifically and exclusively: human schistosomes and associated snail vectors, human malaria parasites and attendant mosquito vectors, and plant crop viruses and their arthropod vectors. Emphasis is given to biologically and ecologically acceptable approaches to the interruption of disease transmission based on innovative studies of microorganism-host-vector relationships, e.g. genetics, biochemistry, immunology, pathophysiology, decreasing reproductive efficiency (juvenile hormones, pheromones), natural predation and ecology.

In addition to the above Research Modules, the project also may fund up to $1.5 million of highly innovative ideas that fall under four secondary areas ("pre-Modules") which are candidates for future Research Module development: engineering technology, earth sciences, marine sciences and genetic resources.

Proposals undergo internal and external scientific peer review and are evaluated for: scientific merit, relevance to development; new and innovative character; and potential to enhance LDC scientific and technological capacity. Proposals are fully funded in the year they are approved and normally will not exceed three years or $150,000.

Ninety five proposals have been funded, involving scientists in 26 LDC countries. In FY 1983, 26 or 60% of the 43 proposals funded originated from LDC scientists and all the remainder except two involved LDC scientists. (See listing for the FY 1983 proposals under Section IV of the ABS.)

Host Country and Other Donors: Host country institutions will contribute facilities and some administrative support. LDC originated proposals often provide at least 25% of the estimated total costs in accordance with local USAID policies.

Beneficiaries: Researchers who are working on development problems keyed to improving the status of the poor inhabitants of LDCs will be the immediate beneficiaries. Ultimate beneficiaries will be the poor inhabitants of LDCs whose lives will be improved by the research.

FY 1985 Program: $5,000 will fund an estimated 40 grants in the five Research Modul averaging $1,000 per Module. 50%-60% of these proposals are expected to originate f LDC scientists encouraged by increased Mission participation in the Agency research priority program. $800 will fund an estimated 8 grants, mainly from LDC scientists under the pre-Modules. $600 will fund 4-6 bridge projects with other AID offices fo follow-on support to completed SCI projects. $100 will be used to evaluate the prog

Major Outputs: Research reports, practical inventions, innovations introduced into major long-term development research efforts and demonstrated feasibility of new research areas.

A.I.D. - Financed Inputs	FY 1985
R&D grants and contracts	6,400
Evaluation	100
	6,500

U.S. FINANCING (In thousands of dollars)	Obligations	Expenditures	Unliquidated	Funding Period	Principal Contractors or Agencies
through September 30, 1982	7,055	1,340	5,715		
Estimated Fiscal Year 1983	4,850	4,000		fully funded proposals	
Estimated through September 30, 1983	11,905	5,340	6,565		
Proposed FY 1984	5,500	5,000		fully funded proposals	various
Estimated through Fiscal Year 1984	17,405	10,340	7,065		
Proposed FY 1985	6,500	Future Year Obligations	Estimated Total Cost		
		continuing	continuing		

PROGRAM: Centrally Funded

ACTIVITY DATA SHEET

PROJECT MANAGER: Dr. Irvin Asher

TITLE	FUNDS	PROPOSED OBLIGATION (In thousands of dollars)		
Strengthening Scientific and Technological Capacity	Sel. Dev. Problem - S&T	FY 85 500		LIFE OF PROJECT (auth) 2,125
NUMBER 938-5543 GRANT ☒ LOAN ☐ NEW ☐ CONTINUING ☒	PRIOR REFERENCE Centrally Funded Annex V, page 150	INITIAL OBLIGATION FY 81	ESTIMATED FINAL OBLIGATION FY Continuing	ESTIMATED COMPLETION DATE OF PROJECT FY Continuing

Purpose: To strengthen LDC Scientific and Technological Capacity to undertake the research and experimentation necessary for development.

Background and Progress to Date: In 1981 this project funded seven proposals of which most were two to three year technical assistance efforts. In 1982 this general category of major technical assistance was essentially dropped. This project now will focus mainly on identifying LDC leadership potential in science and providing some of the resources necessary to realize a fuller development from such leadership. Toward this end the project will:

- -- provide consultants to strengthen the design of LDC research proposals
- -- provide grants to train scientists and supporting technicians;
- -- encourage the development of scientific curricula and facilities at the university and high school levels;
- -- foster the exchange of U.S. scientists and other technological experts with developing countries;
- -- develop LDC capacity for the repair and maintenance of scientific equipment;
- -- and gather, analyze and disseminate information relevant to the scientific and technological needs of developing countries.

There will be a close relationship between technical assistance needs identified through the competitions under the Innovative Scientific Research Project (938-5542) and activities funded under this project.

Beneficiaries: Scientists and technical support staff working in development fields key to improving the status of the poorer inhabitants of LDCs will be the immediate beneficiaries. Ultimate beneficiaries will be the poor inhabitants of LDCs who are recipients of the improved scientific and technological capacities of these countries.

Host Country and Other Donors: Host country institutions will contribute facilities, salaries and administrative support. Complementary funds from the private sector and other donors will be sought.

FY 1985 Program: Technical assistance to LDC research institutions, private sector internships for LDC scientists, transitional research support for recently returned U.S. trained LDC scientists, core support for the fellowship program with the American Association for the Advancement of Science.

Major Outputs: Improved design of LDC research proposals, better utilization of selected LDC scientists' research skills, special LDC-U.S. institutional agreements for the promotion of science, innovative arrangements with the private sector to contribute experts to science development in LDCs, capacity strengthening in such areas as scientific equipment maintenance and food contamination studies, and information exchange.

A.I.D. Financed Input:	FY 1985
Grants and contracts	500

U.S. FINANCING (In thousands of dollars)	Obligations	Expenditures	Unliquidated	Funding Period	Principal Contractors or Agencies
Through September 30, 1982	1,621	535	1,086		
Estimated Fiscal Year 1983	150	800		fully funded proposals	
Estimated through September 30, 1983	1,771	1,335	436		Various
Proposed FY 1984	500	600		fully funded proposals	
Estimated through Fiscal Year 1984	2,271	1,935	336		
Proposed FY 1985		Future Year Obligations	Estimated Total Cost	fully funded proposals	
		continuing	continuing		

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON D.C. 20523

25 March 1983

OFFICE OF THE SCIENCE ADVISOR

PROGRAM IN SCIENCE AND TECHNOLOGY COOPERATION (PSTC)

WHAT IS THE PSTC?

The Program in Science and Technology Cooperation (PSTC), initiated in 1981, is a Congressionally-mandated activity of the U.S. Agency for International Development (AID). It is an important instrument of AID's policy to establish priorities for future programs in research and technology transfer. This program is administered by the Office of the Science Advisor (AID/SCI). It is currently implemented by a system of competitive research grants which undergo scientific peer as well as administrative review.

WHO CAN SUBMIT PROPOSALS TO PSTC?

We particularly wish to encourage and give priority to submissions from scientists in developing countries that receive USAID development assistance, i.e., those with a USAID Mission or AID Representative. Consultation and collaboration with U.S. institutions, including training and travel, may be paid for out of project funds. Submissions from U.S. institutions, Government agencies and from technical divisions of private corporations should include substantial linkages with LDCs whenever possible.

WHAT AREAS ARE OF INTEREST?

PSTC seeks new research ideas in the natural sciences, i.e., biology and chemistry, and in engineering. By research we mean the testing of a scientific hypothesis or development of a new technology through organized observation in an experimental setting (laboratory or field). Such research should be aimed at the discovery of new knowledge or the revision of accepted facts, theories or practices in the light of valid new information. Innovative approaches and findings that can be readily applied to serious problems in developing countries are accorded highest priority.

AID/SCI received nearly 1300 preproposals during its first four cycles of open competition. Based on this experience and on several in-depth US/LDC meetings on specific new technologies, AID/SCI has identified four areas of investigation, so-called "Research Modules," for special emphasis and priority funding:

1. Biotechnology in human, animal and/or plant systems, including plant tissue culture, recombinant microbiology (genetic engineering) and monoclonal antibodies and related immunological techniques for better and more rapid diagnosis, immunotherapy, vaccine development and industrial applications.

2. Chemistry for World Food Needs, particularly biochemical growth regulation in plants and animals, soil chemistry, soil-plant-animal relationships (biochemistry), innovative food chemistry, studies of natural pesticides from plants, and the chemistry of integrated aquaculture systems.

3. Biomass Resources and Conversion Technology, including new and improved processes for producing fuels, fodder and chemical feedstocks from biomass, especially better digestion and use of lignocellulose, improved thermochemical cleaning and storage of producer gas, and development of underutilized (e.g., aquatic) biomass resources.

4. Biological Control of three groups of disease-causing microorganisms and their respective vectors, specifically and exclusively: human shistosomes and associated snail vectors, human malaria parasites and attendant mosquito vectors, and plant crop viruses and their arthropod vectors. Emphasis is given to biologically and ecologically acceptable approaches for the interruption of disease transmission based on innovative studies of microorganism-host-vector relationships, e.g., genetics, biochemisty, immunology, pathophysiology, decreasing reproductive efficiency (juvenile hormones, pheromones), natural predation and ecology.

We anticipate allocating $1 million annually to each Module. Individual research grants normally range from a few thousand dollars up to $150,000, including overhead if any.

WHAT OTHER TOPICS CAN BE CONSIDERED?

In addition to the above Research Modules, AID/SCI is reserving an overall total of $1 million to fund selected, innovative proposals in the following four targeted areas ("pre-Modules") which are candidates for future Research Module development:

(1) Engineering Technology -- structural/materials research, mechanical engineering, and low-cost information technology, including micro-electronics.

(2) Earth Sciences -- meteorology, hydrology, geology and seismology, especially improved LDC weather and earthquake hazard prediction and remote sensing for natural resource analysis.

(3) Marine Sciences -- development of new and underutilized species and resources, breeding of cultivable species, preservation of needed habitat (e.g., coastal zones).

(4) Genetic Resources -- germplasm research, study of underexploited tropical plants and micro-organisms (and development of their potential contributions) and research on related habitat maintenance/enhancement.

The diverse scope of the above Research Modules and pre-Modules accommodates a relatively broad spectrum of scientific interests. Preproposals which do not fall substantially within any of these foregoing areas will be rejected. Specifically, PSTC does not normally fund: planning nor policy studies, international conferences, core support for organizations, travel grants, social sciences research, surveys nor evaluations, operational baseline data collection, routine mapping nor state-of-the-art and literature reviews. It does not continue projects previously funded by, or more appropriate to, other components of AID, e.g., conventional technical assistance, applications of known techniques, nor traditional technology transfer. In particular, PSTC does not support projects of limited benefit to just a single country; such projects are normally part of the AID bilateral program. Training may certainly be included to achieve the purposes of a well-defined research project, but not as primary or general objectives outside of a specific research protocol.

HOW CAN I SUBMIT A PROPOSAL?

Prepare a concise 2-3 page* preproposal in English describing in succinct, highly specific terms:

(1) Project title (brief, descriptive);

(2) Investigators and their institutional affiliations; names and addresses only, not a complete curriculum vitae nor bibliography.

(3) Project objective (1-3 sentences);

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*Submissions exceeding three pages will be returned.

(4) Work/research plan and project duration. This is the most important part -- appropriate scientists will judge your proposed research. Do not generalize. Be specific about what scientifically you intend to do. Also indicate what is new or innovative about the work proposed? How does the research relate to other studies in this area?

(5) Importance to LDC development (brief);

(6) Collaborative arrangements in developing countries, if any;

(7) Six-item budget (brief and without details) expressed in U.S. dollars (expenditures under all six items are, of course, not required):

-- salaries
-- equipment/materials (including reagents)
-- travel (must be directly related to the research)
-- training/consultation
-- overhead
-- additional costs not identified in the above categories (explain very briefly)

Preproposals (2 copies) may be sent at any time, but are only reviewed once a year. The next deadline for receipt in AID/SCI/Washington is 1 February 1984. LDC investigators should submit their preproposals to AID/SCI through their local USAID Mission, allowing sufficient time (3-4 weeks) for transmission. U.S. and other institutions are encouraged to collaborate with LDC counterparts and to submit through an LDC institution whenever possible.

Following an internal review of preproposals, selected investigators will be asked to submit a full proposal for subsequent external scientific peer review. The local USAID Mission is consulted on projects related to their host country. Funding decisions should not be anticipated any sooner than 9 months after the closing date for submitting preproposals, and a modestly longer interval is probably more realistic.

PSTC is an experimental Program and supports primarily the initial, particularly innovative phase of an investigation (usually 2 to 3 years). Grants for the entire length of the project range from a few thousand dollars up to $150,000, including overhead if any.

HOW ARE PROPOSALS EVALUATED?

AID/SCI welcomes innovative ideas for research projects from the widest possible spectrum of scientists. Competition for PSTC grants is thus very intense. During our FY 1983 review cycle nearly 400 preproposals were received. Approximately 80 of these were subsequently requested as full proposals and only about 40 funded. Similar numbers of proposals are expected in subsequent years. The specific number of grants awarded annually will obviously depend on the availability of funds.

In evaluating preproposals as well as full proposals and making funding decisions, AID/SCI utilizes four primary criteria:

(1) scientific merit,

(2) relevance to development,

(3) innovation, and

(4) potential to enhance LDC scientific and technological capacity.

In considering relevance to development, emphasis is given to three underlying objectives of PSTC itself: to stimulate and support new and innovative research approaches to current or emerging development problems; to assist less-developed countries in building the scientific and technical capacity needed to attack such problems themselves; and to involve LDC scientists more directly in priority setting, science planning, information exchange and technology transfer.

We hope it will be helpful to provide some information about why projects have not been accepted in the past. Many preproposals are rejected because they contain too many generalities, and fail to describe definitively what scientific methodology is to be used. In order to compete with other preproposals, specific details and a concise focus/objective are essential. In addition, a number of preproposals are either not new nor are they innovative; they simply employ routine or well-established techniques and principles. Applicants are encouraged to be very specific about the scientific details of what they propose to do and devote less attention to generalities, overall justifications and broad rationale.

HOW DOES PSTC RELATE TO A CURRENT COMPLEMENTARY NAS PROGRAM?

The first funding allocation of the PSTC was a large grant to the U.S. National Academy of Sciences (NAS) entitled "Applying

Science and Technology to Development." The NAS Board on Science and Technology for International Development (BOSTID) uses these funds to convene workshops, organize advisory teams, and issue study reports on a variety of research opportunities related to development. After selecting well-defined topics, the NAS invites specific institutions in developing countries with relevant capabilities to submit proposals for definitive research tasks. NAS subgrants are made only to LDC institutions.

Currently, six scientific areas are approved for NAS research granting: grain amaranth, biological nitrogen fixation, fast-growing nitrogen-fixing trees, mosquito vector field studies, rapid epidemiological assessment and causes of acute respiratory diseases in children. BOSTID does not currently consider proposals outside of the above six topics. For further information on this BOSTID program, you may contact Dr. Michael Greene, Board on Science and Technology for International Development, National Academy of Sciences, 2101 Constitution Avenue, N.W., Washington, D.C. 20418, U.S.A.

WHERE CAN ONE GET MORE INFORMATION ABOUT PSTC?

You may contact AID/SCI at:

Office of the Science Advisor
Agency for International Development
AID/SCI, Room 311, SA-16
Washington, D.C., USA 20523
Telephone: (703) 235-3666

The next deadline for receipt in Washington of 2-3 page preproposals is 1 February 1984.

Listing of Proposals Funded Under
the Innovative Scientific Research Project

FY1983

PROPOSAL/GRANTEE	AMOUNT	PURPOSE
AGRICULTURE		
Role of Mycorrihizae in the Phosphorus Nutrition of Economic Leguminous Crops (2A-04) Grantee: Kasetsart University (Thailand)	160,000	To improve the phosphorus nutrition of soybeans, mungbeans and peanuts in Thailand through symbiosis with mycorrihizal fungi.
New Varieties of Rice for Saline and Acid Soil Conditions (2A-15) Grantee: Chulalongkorn University (Thailand)	126,600	To use tissue culture techniques to produce two new high-yield rice varieties, one highly tolerant to saline soil, the other to acid soil.
Soil Salinity Control for the Growth of Plants Which Can Serve as an Energy Source (3A-02) Grantee: King Mongkut's Institute of Technology (Thailand)	150,000	To develop a soil salinity control system which would permit the growing on coastal waste land in Thailand of a plant which can produce a fuel oil.
Isolation of Strains, Clones and Regeneration of Plants from Single Cells of Winged Beans (3A-03) Grantee: University of Houston in collaboration with the University of Peradeniya (Sri Lanka)	95,702	To develop tissue cultures of the winged bean, Psophocarpus tetragnolobur.
Development of Microbial Control Agents of the Brown Planthopper (3A-05) Grantee: Boyce Thom[illegible] [illegible]ti[illegible]te at Cornell Un[illegible] a[illegible] the Internatio[illegible] [illegible]earch Institute [illegible]	165,450	To find a pathogen(s) which alone or as part of a pest management system will restrict brown plant hopper populations in Asia below their epidemic threshold.

The Winged Bean in Tropical Cropping Systems (3A-07) Grantee: University of Maryland and the University of Peradeniya (Sri Lanka)	73,475	To conduct a series of experiments in the greenhouse and in the field for improving winged bean production as part of a mixed cropping system.
The Infection Process in the Formation of Nitrogen-Fixing Stem Nodules of Sesbania Rostrata (3A-13) Grantee: University of Minnesota and the ORSTOM Center in Dakar (Senegal)	42,833	To study important new nitrogen fixation mechanisms in the recently discovered stem modules of S. Rostrata, a Sahelian legume. Unlike those in common root nodules, the rhizobia bacteria in this system seem to be unaffected by external nitrogen in the soil.
Grain Amaranth: The Development of Improved Locally Adapted Varieties Utilizing Existing Germ Plasm Resources (3A-24) Grantee: Rodale Research Center	150,000	To initiate a breeding program for this important, neglected grain, native to the semi-arid regions in Latin America. This complements the network of LDC research institutions working on grain amaranth under the National Academy of Sciences (BOSTID) program.
Plant Products as Potential Herbicides (3A-25) Grantee: Tribhuvan University (Nepal)	79,459	To identify Nepal plants in the Lumbini Zone which may have properties that can be used for weed control or crop stimulation.
The Prospect of Vegetable Cultivation in the Chitwan Valley, Nepal (3A-33) Grantee: Institute of Agriculture and Animal Science (Nepal)	70,070	To determine how to exploit the vegetable growing potential of this part of Nepal.
Studies of Late Blight of Potato and Tomato in Chitwan Valley of Nepal (3A-34) Grantee: Institute of Agriculture and Animal Science (Nepal)	46,341	To find a way to manage late blight disease which has discouraged the growing of tomatos and potatos in the Chitwan Valley.

Industrialization of Coffee Pectins (3A-36) Grantee: Instituto Centroamericano de Investigacion y Technologia Industrial (Guatemala)	101,400	To determine the feasibility of exploiting the pectins found in coffee-processing wastes for food applications.
Development of the Most Important Root and Tuber Crops in Sri Lanka (3A-48) Grantee: University of Peradeniya (Sri Lanka)	35,478	To develop a carbohydrate alternative to rice by collecting the most important locally available germplasm of roots and tubers, identifying and characterizing them, and selecting the best for crop improvement programs.
Improving Nitrogen Fixation in Grain Legumes Using Selected Strains of Rhizobia (3A-49) Grantee: University of Peradeniya (Sri Lanka)	21,650	To study the effectiveness of selected Rhizobia bacteria on nitrogen fixation in grain legumes of Sri Lanka.
Biological Control of Some Insect Pests of Vegetables in Sri Lanka (3A-51) Grantee: Central Agricultural Research Institute (Sri Lanka)	32,010	To identify biological means to control five insect pests affecting tomatoes, cabbage, beans, eggplant, and gourds.
Design, Construction, and Field Testing of Rice Drying and Storage Facilities Appropriate for Sierra Leone Farmers (3A-58) Grantee: University of Sierra Leone	95,000	To reduce post-harvest grain losses through the development of improved farm site drying and storage facilities.
Development of a Modified Live Vaccine Against Bovine Babesiosis (3A-59) Grantee: University of Missouri	14,000	To isolate and clone babesia parasites and identify those that produce minimal side effects while eliciting protection against infection.

ENERGY AND ENVIRONMENT

Cooperative Monsoon Research Program (2E-15) Grantee: Florida State University in conjunction with the Indian Institute of Technology (Kanpur, India)	144,642	To develop a weather prediction capability bas d on computer models at the Indian Institute of Technology at Kanpur.
Design and Development of a Low Cost Grain Dryer (3E-06) Grantee: Economic Development Foundation (Philippines)	54,500	To field test a prototype design for a low-cost grain dryer for small farmers
Low Capital Fuel Gas Production from Combined Organic Residues (3E-20) Contractor: DYNATECH R/D Company in collaboration with LDC institutions in 10 countries.	173,008	To investigate a low capital system for production of fuel gas from the combined organic residues in LDC wastesheds, including municipal, industrial and agricultural wastes.
Propagation of Mahaseers In Himalayan Waters of Nepal (3E-30) Grantee: Tribhuvan University (Nepal)	34,000	To preserve these edible fish in the hydroelectric dam reservoirs blocking their normal spawning runs.
Enhancing Biogas Production at Low Temperatures (3E-32) Grantee: Biogas Newsletter (Nepal) and Shakti Energy (Nepal)	4,000	To test simple solar pre-heating designs for biogas digesters in cool climates.
Improved Management of Important Fodder Trees in the Terai and Outer Himalayas (3E-33) Grantee: Tribhuvan University (Nepal)	72,125	To determine how fodder trees could be used more effectively to meet the feed deficit for livestock in areas such as Nepal.

Study of Some Environmental Effects of Diama and Manantali Dams in the Senegal River Valley (3E-40) Grantee: University of Daka-Fann (Senegal)	117,000	To develop remote sensing methods to study the impact of two new dams on acacia forests and farming along the Senegal River.
Salt Gradient Solar Ponds for West African Applications (3E-48) Grantee: University of Benin (Togo)	124,000	To design an efficient solar pond for rural areas in southern Togo, especiall as a source of energy for drying corn.
Development of a High Gradient Magnetic Separation Pilot Prototype Plant (3E-58) Grantee: University of San Andres (Bolivia) and Sala Magnetics (subsidiary of Allis-Chalmers)	144,000	To design and construct a continuous flow plant that can separate tin oxide from calcium and iron borosilicates particles, using their differing magnetic properties.
An Assessment of the Mariculture Potential of Indigenous Eastern Caribbean Brine Shrimp (Artemia) (3E-59) Grantee: Island Resources Foundation (Virgin Islands)	155,320	To provide a technical basis for evaluating the development potential for growing local brine shrimp in Eastern Caribbean salt ponds.
Producer Gas from Rice Husks (3E-60) Grantee: University of California at Davis and the International Rice Research Institute (Philippines)	108,950	To test the feasibility of producing producer gas from rice husks suitable for direct feed into a low horsepower internal combustion engine for use by small farmers
HEALTH		
The Relationship Between the Control of Ascaris Infection and Child Nutritional Status (2H-18) Grantee: Department of Medical Research Ministry of Health (Burma)	150,000	To define the relationship between infection by the Ascaris worm and poor nutritional status in children.

Ascaris Infection and Food Intake (3H-06) Grantee: Cornell University in conjunction with the Ministry of Health of Panama	145,032	To investigate the significance of the intestinal parasite Ascaris lumbricoides on the dietary practices and food intake of preschool children.
Effect of Chemotherapeutic Agents on Malarial Sporozoites in Vitro (3H-09) Grantee: Rutgers University	155,670	To develop and use an assay to evaluate the effects of different chemotherapeutic agents on malaria parasites grown in a laboratory. (Until recently malaria parasites had to be obtained from blood samples, which did not provide enough material to do large scale comparative testing.)
Primary Eye Care: A Treatment Guide for Front Line Health Workers Using a Hand-Held Computer (3H-12) Grantee: University of California at Davis & Rutgers University in collaboration with Ministries of Health in Egypt and Tunisia	184,437	To determine the advantages of hand-hel "expert" computers with preprogrammed instructions for diagnosis and treatment of ailments such as eye disorders. The computers may provide more comprehensive diagnoses with less worker training.
ELISA Diagnosis of Tuberculosis in Bolivia (3H-18) Grantee: Case Western University and the Ministry of Social Welfare and Public Health (Bolivia)	127,332	To determine whether Enzyme-Linked Immunoabsorbent Assay (ELISA) techniques can be used under LDC field conditions to identify quickly people with active tuberculosis. Existing skin tests only measure exposure.
Investigation of the Healing Properties of the Plant Extract "Sangre de Grado" and its Possible Utilization as a Therapeutic Agent (3H-22) Grantee: Universidad Peruana Cayetano Heredia (Peru)	115,542	To assess the suitability of this traditional preparation as a commercial pharmaceutical.

Onchocerciasis in the Cameroons: The Development of ELISA for Immunodiagnosis (3H-24) Grantee: Centre Universitaire des Sciences de la Sante (Cameroon) and Johns Hopkins University	156,250	To develop a sensitive and specific test for indicating onchocerciasis infection through the identification of antigens in human blood, urine or saliva.
Comparison of Two in Vitro Techniques for Culture of P. falciparum in the Production of Antigens for Immunologic Evaluation of Malaria Endemicity (3H-33) Grantee: Chiengmai University (Thailand)	60,100	To determine the most effective way to increase supplies of the malaria parasites for use in the expanded Thai malaria research and control program.
Study of the Putative Chloroquine and Quinine Receptor(s) in the Plasmodium falciparum Malaria (3H-34) Grantee: Lovelace Medical Research Foundation	150,000	To determine the biochemistry that explains the resistance of human malaria to chloroquine and quinine.
NUTRITION		
Biochemical and Nutritional Studies of Philippine Indigenous Food and Forage Legumes (2N-04) Grantee: University of the Philippines	150,000	To provide a comprehensive biochemical and nutritional assessment of indigenous food and forage legumes in the Philippines, with emphasis on relatively unknown and underutilized species
Cassava: Consumption and Digestion by Small Children (3N-04) Grantee: Instituto de Investigacion Nutricional (Peru) and the Johns Hopkins University	133,368	To compare the impact on child caloric levels of different preparations of this LDC staple. Digestibility varies with preparation, which may have considerable implications for small children.

Destruction of Aflatoxin in Corn and of Nucleic Acids in Yeast-Corn Mixtures by the Alkaline Cooking Method (3N-06) Grantee: Instituto Centroamericano de Investigacion y Technologia Industrial (Guatemala)	118,100	To test how successfully traditional cooking of corn in lime may destroy the high levels of aflatoxin found in village corn. To test whether this same process destroys excess nucleic acids in yeast, a potential food supplement.
OTHER		
Investigating, Developing, Adapting and Testing Interactive Videodisc Science Instructions for LDCs (3C-05) Grantee: University of Nebraska-Lincoln and the Nebraska Educational Television Network	159,400	To develop a low cost version of U.S. college-level videodisc educational systems for laboratory sciences for use in LDC's. The test will be conducted in Indonesia.
Integrated Development of Machine-Aided Translation from English to Spanish in Support of Information Transfer to LDCs in the Health Field (3C-06) Grantee: Pan American Health Organization	152,342	To develop an operational system for translation from English into Spanish in the health field, which contains an extensive and specialized vocabulary. (The converse, a Spanish to English translator already exists, but that is a considerably simpler task.)
Small Grants Cooperation with the International Foundation for Science - II Grantee: National Academy of Sciences as funding mechanism for the International Foundation for Science	390,754	To fund the balance of a second two-year grant in support of the small grant program of the International Foundation for Science. (Grants are for young developing country scientists, do not exceed $10,000 per year, and usually fund foreign exchange items such as equipment. The two-year period is for July 1, 1983 to June 30, 1985.)
Total	$4,939,340	

Listing of Proposals Funded Under
the Strengthening S&T Capacity Project

FY1983

PROPOSAL/GRANTEE	AMOUNT	PURPOSE
TECHNICAL ASSISTANCE TO STRENGTHEN RESEARCH DESIGN		
Use of Azolla for Nitrogen Fixation in the Egyptian Rice Cultures (2A-02) Recipient: Alexandria University (Egypt)	5,500	To enable Alexandria University to assemble a group of experts to address questions raised by the external scientific review panel and to develop a detailed research plan. Azolla is a plant substitute for petroleum-based fertilizer. (Proposal not funded.)
Production of New Varieties of Rice for Saline and Acid Soil through Tissue Culture (2A-15) Recipient: Chulalongkorn University (Thailand)	9,860	To permit the principal researcher to take advantage of the experience of the Colorado State University rice tissue culture research program in reformulating a more realistic three-year research plan. (Revised proposal funded.)
Plant Products as Potential Herbicides (3A-25) Recipient: Tribhuvan University (Nepal)	7,500	To assist the principal investigator develop a better work plan to explore and test the potential of local plant products for weed control. (Revised proposal funded.)
Germplasm Collection, Classification, and Evaluation of the Lesser Known Yams (Aroids, Dioscoreas) (3A-48) Recipient: University of Peradeniya (Sri Lanka)	6,500	To assist the principal investigator develop a more complete experimental design in studying whether lesser-known yams grown in Sri Lanka could become a more significant agricultural crop. (Revised proposal funded.)

Biological Control of Insect Pests of Vegetables in Sri Lanka (3A-51) Recipient: University of Peradeniya (Sri Lanka)	6,500	To assist the principal investigator tighten up his research plan to investigate the parameters of biological control of selected insect pests of tomatoes, cabbage, cucurbits, beans, and eggplant. (Revised proposal funded.)
Design Study of Thermosyphons and Its Integration with a Collector (3E-31) Recipient: Tribhuvan University (Nepal)	7,000	To assist the principal investigator engineer the better design of a low-cost solar hot water system with thermosyphon circulation between the solar collector and the storage tank. (Recommendation to provide $12,176 for institutional support approved; research proposal not funded.)
Seaweed Biomass (3E-41) Recipient: Centre de Recherches Oceanographiques (Senegal)	10,000	To assist the principal investigator develop a more rigorous approach to determining the best potential uses of seaweed biomass for poor farming families living along the coast. (Consultancy not yet performed.)
Study of the Dynamics of Ascaris Infections in a Village Community (2H-18) Recipient: Parasitology Research Division, Ministry of Health, Burma	10,000	To send a distinguished U.S. scientist to help the principal investigator incorporate in the proposal the proper research procedures and a clearer understanding of the disease. (Revised proposal funded.)
Investigation of the Healing Properties of the Plant Extract "Sangre de Grado" (3H-22) Recipient: Universidad Peruana Cayetano Heredia (Peru)	*	To assist the principal investigator develop better biologic experiments to assess the suitability of this traditional preparation as a commercial pharmaceutical. (Revised proposal funded.)

*Consultant performed tasks at no cost to AID.

OTHER ACTIVITIES

Design Study of Thermosyphons and Its Integration with a Collector (3E-31) Grantee Tribhuvan University (Nepal)	12,176	To enable the principal investigator expand his work on low-cost solar hot water systems using thermosyphons. The institution does not yet have the capability to do innovative scientific research in this area.
Science, Engineering, and Diplomacy Fellows Program Grantee: American Association for the Advancement of Science (AAAS)	55,000	To provide core support to enable AID to continue to participate in the program. SCI support will fund one fellow and AID's share of the costs of interviewing the candidates. We expect that other AID offices will asume the costs of 3-4 additional fellows for assignment to their areas.
Total	$ 130,036	

Public Health Service

National Institutes of Health
National Cancer Institute
Bethesda, Maryland 20205

March 3, 1983

3H-22

Dr. Irvin Asher
AID/SCI
SA-16 Room 311
Washington, D.C. 20523

Re: Project 3H-22 (Sangre de Grado) - Site Visit to Universidad Peruana Cayatano Heredia

Dear Dr. Asher:

I met with the author of this project, Dr. Abraham Vaisberg, in Lima on February 25 and had a detailed point by point discussion of his project with him.

My initial reading of the proposal left me with serious suspicions about the ability of Dr. Vaisberg to carry out the project but I am pleased to report that the proposal is in fact a very sound one which was not well written and omitted key details.

One of my major concerns was the chemistry, since all of the preliminary work was done with an alkaloidal fraction (F-III) rather than purified material. This was due to two factors, the difficulty in finding a chemist to collaborate on the project (since solved) and the high purity of the alkaloidal fraction which was greater than 90-95% of one main component. Dr. Vaisberg told me that he did not want to put the information about the high purity of the alkaloidal fraction in his proposal because he was not a chemist and did not want to make statements that weren't well supported.

Another concern was the breadth of the project since it involved elements of botany, chemistry, cell culture, statistics, in vivo testing and pathology. I was not confident that all this work could be done by only Dr. Vaisberg and a chemist collaborator but I found that there were additional qualified collaborators in the areas of botany, pathology and statistics who had not been listed in the proposal for political reasons of how salaries are paid, etc.

I also felt from the proposal that some of the preliminary work was not well designed because I didn't understand the rationale for some of the experiments but, through conversation with Dr. Vaisberg, it became clear that the experiments were entirely logical and the rationale had not been adequately explained on the proposal.

As a result of discussions of my criticisms of the proposal and those of the official review the weaknesses in the structure of the proposal were

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brought out and Dr. Vaisberg will rewrite and resubmit the proposal which I feel should be suitable for acceptance.

I disagreed with the official review which implied that all work should only be done with pure products. It is necessary to work with the reality that what is being used by thousands of people is the crude latex of "Sangre de Grado" and the possible toxicity and carcinogenicity of this preparation must be investigated in addition to the properties of the purified active compound.

I felt that in addition to getting a new proposal from Dr. Vaisberg it would be desirable to increase the expertise on the review panel in the area of natural products chemistry and traditional medicine.

I found the facilities at the University to be of very good quality and I feel that the proposed project can be successfully carried out.

Sincerely,

Matthew Suffness

Matthew Suffness
Acting Chief, Natural Products Branch
Developmental Therapeutics Program
Division of Cancer Treatment, NCI

PART IV. SUMMARY STATUS OF ACTIVITIES

A. Project Status Chart under Grant

LETTER OF AGREEMENT NO.	ACTIVITY DESCRIPTION
Projects Completed	
6	Interciencia Symposium on Biomass Substitutes
7	Discussion Seminar: Food Production Systems and Environmental Rehabilitation in Somalia
8	Reprints of Energy-Related BOSTID Reports for the U.N. Conference on Energy, Nairobi
11	Discussion Seminar: Conference on Biological Diversity
12	ECOWAS Workshop on Energy Strategies for West Africa
15	Discussion Seminar: U.S. Input to OECD Workshop on Training for S&T Personnel in Developing Countries
18	Feasibility Meeting on Coastal Zone Management Assistance for Developing Countries
19	Workshop/Conference on Biotechnology Research
Projects in Progress (letters of agreement signed)	
1	Production of Study Reports (partially completed)
2	Underexploited Village Resources of Southeast Asia
3	Supplement to Firewood Report
4	Casuarina Species Study
5	Amaranth Study (staff costs only)
10	Study on Marine S&T in Developing Countries
13	Workshop to Examine Manpower Needs and Career Opportunities in the Field Aspects of Vector Biology

LETTER OF AGREEMENT NO.	ACTIVITY DESCRIPTION
14	Update of Jojoba (staff costs only)
16	Opportunities for Guinea Worm Disease Control
17	Science and Technology Assessment in Ecuador
22	Leucaena Update
Projects in Progress	(letters of agreement submitted but waiting for AID signature)
23	Study on Application of Mini-computers to Development
24	ACTI Study on Revegetating the Range
25	ACTI Study on Energy from Grasses
26	Computer Conferencing
Projects Being Planned	
	ACTI Study on Traditional Agriculture Systems
Amendments to Grant with Additional Funds	
Amend. No. 3	Workshop on Energy and Agriculture in Developing Countries ($47,220) (Completed)
Amend. No. 5	International Foundation for Science ($450,000) (Completed)
Amend. No. 6	CHEMRAWN II ($250,000)

FINANCIAL STATUS OF RESEARCH GRANTS
March 31, 1983

Grant number Institution, country	Grant Period	Grant Amount	Amount Expended to 3/31/83	Balance
GRAIN AMARANTH				
AMA-GT-1-82-18 INCAP, Guatemala	2/15/82-2/14/84	$118,793	$ 12,295	$106,498
AMA-GT-2-83-21 ALAN, Guatemala	1/28/83-1/27/87	50,000	3,125	46,875
AMA-KE-4-83-22 Univ. of Nairobi Kenya	3 years	94,000	-	94,000
AMA-MX-1-82-51 INIA, Mexico	1/3/82-1/2/86	110,900	12,975	97,925
AMA-PE-1-82-50 CICA, Peru	7/5/82-7/4/85	118,508	28,328	90,180
AMA-TH-2-83-9 Chiang Mai, Thailand	11/25/82-11/25/85	95,140	17,140	78,000
AMA-TH-4-83-18 TISTR, Thailand	1/11/83-1/10/86	87,900	9,723	78,177
BIOLOGICAL NITROGEN FIXATION				
BNF-BR-1-83-30 EMBRAPA, Brazil	3 years	114,430	-	114,430
BNF-ID-1-83-33 SURIF, Indonesia		under negotiation	-	-
BNF-KE-2-83-14 Univ. of Nairobi Kenya	12/3/82-12/3/85	118,715	-	118,715
BNF-PK-1-83-15 NIAB, Pakistan	12/23/82-12/23/85	106,155	-	106,155
BNF-TH-3-83-16 Chiang Mai, Thailand	12/2/82 12/1/86	100,200	8,865	91,335

FAST-GROWING, NITROGEN-FIXING TREES

FGT-CL-1-83-13 INTEC, Chile	11/30/82- 11/30/85	110,185	19,393	90,792
FGT-CL-2-83-31 PUC, Chile	3 years	108,000	-	108,000
FGT-CG-1-83-27 CTFT, Congo	3/15/83- 3/14/87	75,330	-	75,330
FGT-KE-1-82-19 ICRAF, Kenya	3/9/82- 9/30/83	57,024	40,727	16,297
FGT-KE-3-83-17 Univ. of Nairobi Kenya	11/23/82- 11/22/86	163,770	-	163,770
FGT-MW-1-83-10 Bunda, Malawi	4 years	90,440	-	90,440
FGT-MX-2-83-12 INIREB, Mexico	2/15/83- 2/14/86	112,455	9,738	102,717
FGT-PA-1-83-26 Univ. of Panama	3 years	98,685	-	98,685
FGT-PH-1-83-11 ViSCA, Philippines	1/10/83- 1/9/86	116,170	9,870	106,300
FGT-SD-1-83-32 Univ. of Gezira Sudan		under negotiation	-	-
FGT-TH-1-82-20 TISTR, Thailand	2/11/82- 2/10/85	100,000	34,250	65,750

MOSQUITO VECTOR FIELD STUDIES

MVR-MY-1-83-28 Medical Department East Malaysia	3/22/83- 3/21/86	86,270	2,020	84,250
MVR-TH-1-83-28 Mahidol University Thailand	3/22/83- 3/21/85	127,600	-	127,600
		$2,360,670	$ 208,449	$2,152,221

C. BOSTID REPORT DISTRIBUTION (January - March 1983)

PUBLICATION NUMBER	NAME	REQUESTS FILLED F	D	H	TOTAL
8	Ferrocement	162	16	0	178
14	More Water for Arid Lands	311	33	76	420
14F	More Water for Arid Lands (French)	0	1	0	1
16	Underexploited Tropical Plants		Out-of-Stock		
18	Energy for Rural Development	378	25	64	467
19	Methane Generation	333	27	40	400
21	Making Aquatic Weeds Useful		Out-of-Print		
22	Guayule	83	8	0	91
23	Resource Sensing from Space		Out-of-Print		
23F	Resource Sensing from Space (French)	0	20	80	100
* 25	Tropical Legumes	7	0	156	163
26	Leucaena		Out-of-Print		
* 27	Firewood Crops	441	29	144	614
28	Microbial Processes	328	38	70	436
29	Postharvest Food Losses	245	17	98	360
30	U.S. Science and Technology for Development	80	5	0	85
31	Food, Fuel, and Fertilizer	331	31	261	623
* 32	The Water Buffalo	38	7	104	149
33	The Potential for Alcohol Fuels		In Preparation		
34	Revegetating the Range		In Preparation		
35	Sowing Forests from the Air	94	4	0	98
36	Producer Gas		In Preparation		
37	The Winged Bean (Second Edition)	264	57	360	681
38	Supplement, Energy for Rural Development	208	17	80	305
39	Proceedings, International Workshop on Survey Methodologies	87	27	78	192
		3,390	362	1,611	5,363

F= Foreign
D= Domestic
H= Handout

* Our supplies of these reports were exhausted during this reporting period; hence the low number of requests filled.