

AGENCY FOR INTERNATIONAL DEVELOPMENT
PROJECT DATA SHEET

1. TRANSACTION CODE
 A = Add
 C = Change
 D = Delete
 Amendment Number _____
 DOCUMENT CODE 3

COUNTRY/ENTITY: S&T Bureau
 3. PROJECT NUMBER: 936-4136
 4. BUREAU/OFFICE: S&T/AGR [10]
 5. PROJECT TITLE (maximum 40 characters): Collaborative Research - IARCs
 6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM DD YY 019 | 3 | 10 | 9 | 0
 7. ESTIMATED DATE OF OBLIGATION (Under "B." below; enter 1, 2, 3, or 4)
 A. Initial FY 85 B. Quarter 4 C. Final FY 89

8. COSTS (\$000 OR EQUIVALENT \$1 =)

A. FUNDING SOURCE	FIRST FY 85			LIFE OF PROJECT		
	B. FY	C. L/C	D. Total	E. FY	F. L/C	G. Total
AID Appropriated Total	200		200	4200		4200
(Grant)	(200)	()	(200)	(4200)	()	(4200)
Other: 1						
U.S. 2						
Host Country						
Other Donor						
TOTALS	200		200	4200		4200

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH CODE	D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
			1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) ARD	1411	953			4200		4200	
(2)								
(3)								
(4)								
TOTALS					4200		4200	

10. SECONDARY TECHNICAL CODES (maximum 5 codes of 3 positions each)
 073 | 080 | 311 | 312 | 099
 11. SECONDARY PURPOSE CODE
 111
 12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)
 A. Code: R/AGR | BS | BR | DEL | TECH
 B. Amount: _____

13. PROJECT PURPOSE (maximum 480 characters):
 The project purpose is to overcome specific obstacles to technological breakthroughs at the IARCs which the IARCs lack the capacity to address alone. This will be accomplished through grants to U.S. Research institutions or scientists, to carry out cooperative and joint research.

14. SCHEDULED EVALUATIONS
 Interim: MM YY 019 | 8 | 7
 Final: MM YY 019 | 9 | 0
 15. SOURCE/ORIGIN OF GOODS AND SERVICES
 700 941 Local Other (Specify) _____

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of 3 page PP Amendments)

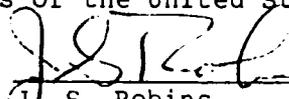
17. APPROVED BY: J.S. Robins SST/FA
 Signature: [Handwritten Signature]
 Date Signed: MM DD YY 019 | 3 | 8 | 5
 18. DATE DOCUMENT RECEIVED BY AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM DD YY

ENTITY: Bureau for Science and Technology

PROJECT TITLE: Collaborative Research on Special Constraints for International Agricultural Research Centers

PROJECT NUMBER: 936-4136

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the centrally funded project entitled: "Collaborative Research on Special Constraints for International Agricultural Research Centers." The project involves planned obligations not to exceed \$4,200,000 of grant funds over a five-year period from FY 1985 through FY 1989 subject to the availability of funds, in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the project.
2. The purpose of the project is to support cooperative and joint research funded through grants to U.S. research institutions or scientists to overcome specific obstacles to technological breakthrough at the International Agricultural Research Centers (IARCs) and which the IARCs lack the capacity to address alone. The program will be implemented by the USDA Cooperative State Research Service (USDA/CSRS) through a Participating Agency Service Agreement (PASA).
3. I hereby determine in accordance with the factors described in the Project Paper that the proposed PASA with the USDA Cooperative State Research Service qualifies under Section 621(a) of the FAA because it is (1) for technical assistance, (2) the Cooperative State Research is particularly suited for this scope of work, (3) this action is not competitive with the private sector, and (4) this work would not interfere with the Service's domestic program.
4. Source and Origin of Goods and Services
 - a. Each developing country where assistance takes place under this project shall be deemed to be a cooperating country for the purpose of permitting local cost financing.
 - b. Goods and services, except for ocean shipping, financed by A.I.D. under the project shall have their source and origin in the cooperating country or in the United States except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the project shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States.



J. S. Robins
Agency Director for Food and Agriculture
Bureau for Science and Technology

Clearances:

S&T/AGR: ARBertrand UAB Date 5/19/85
S&T/MGT: MThome [Signature] Date 5/1/85
S&T/PO: GEaton [Signature] Date 5/2/85

APR 19 1985

ACTION MEMORANDUM FOR THE AGENCY DIRECTOR FOR FOOD AND AGRICULTURE
BUREAU FOR SCIENCE AND TECHNOLOGY

FROM: S&T/AGR, Anson R. Bertrand *ARB*

SUBJECT: Authorization for S&T's Collaborative Research on Special
Constraints for International Agricultural Research Centers (IARCS)
Project 936-4136

Problem: Your approval is required to implement a five year project entitled "Collaborative Research on Special Constraints for International Agricultural Research Centers" requiring the obligation of AID funds in the amount of \$4,200,000 over the life of the project.

Discussion: The IARCs include thirteen Centers sponsored by the Consultative Group for International Agricultural Research (CGIAR) and others not sponsored by the CGIAR. These latter ones include the Asian Vegetable Research and Development Center, the International Fertilizer Development Center, the International Center for Insect Physiology and Ecology, the International Board for Soil Research and Management and the International Irrigation Management Institute. While these programs have achieved many notable successes, the Centers have encountered frustrating bottlenecks in their research activities. Examination of these bottlenecks reveals that the majority might be overcome by using the highly specialized scientists, equipment and methodologies available at U.S. research institutions, but which are not readily accessible to the IARCs. Because of their mandates and funding constraints, the Centers cannot hire staff or purchase equipment to meet short-term requirements. As a general rule, the overall budget process and administrative structure also make it difficult to budget or contract for such requirements. This project has been proposed as an alternative means for meeting these needs and for encouraging increased substantive linkages between the IARCs and U.S. research institutions and scientists.

The purpose of the project is to overcome those specific obstacles to technological breakthroughs at the IARCs which the Centers lack the capacity to address alone. Over the past few months, Center Directors have identified a number of critical areas for such research studies. The project will provide back-up research on identified key constraints by awarding relatively small short-term grants to U.S. research institutions.

The project will be carried out through a Participating Agency Support Agreement (PASA) with the U.S. Department of Agriculture, Cooperative State Research Service (USDA/CSRS). The qualifications of USDA/CSRS, together with a description of its research mandate, are described in the project paper. USDA/CSRS will provide a program manager and support services, including peer review panels, necessary to award and administer thirty short-term grants per year at a yearly cost of \$8,000 to \$50,000 each for a period of one to three years. Final review and authorization of all grants will be by the Director, Office of Agriculture, Bureau for Science and Technology or his designate.

The Agricultural Sector Council reviewed and endorsed the project paper on March 29, 1985. A copy of the endorsement sheet is attached.

Funds for the project totalling \$200,000 are included in the Office of Agriculture's approved FY 1985 OYB. An Advice of Program Change has been submitted to Congress describing the five year \$4.2 million project.

Recommendation: That you approve the five year project by signing the attached PAF.

Attachments:

1. Project Authorization and Data Sheet
2. Endorsement Sheet
3. Project Paper

APPROVED: J. S. F. [Signature]
DISAPPROVED: _____
DATE: 5/13/85

Clearances:

S&T/AGR, FCLi [Signature] Date 4/19/85
S&T/PO, GEaton [Signature] Date 5/6/85
S&T/NGT, NTnome [Signature] Date 5-1-85

S&T/AGR: J. Walker:dh:4/10/85:Revised:4/18/85:W2614e

SECTOR COUNCIL FOR AGRICULTURE

RECORD OF S&T PROJECT REVIEW COMMITTEE MEETING

COMMITTEE MEETING DATE:

1. Project Office: S&T/AGR Project Number: 936-4136
 Project Title: Collaborative Research-U.S. Research Institutions and IARCS
 Proposed Contractor: USDA/CSRS
 Proposed Project Period: 4/85 - 9/90
 Proposed Budget Period: FY 85 - FY 89 Budget: \$4,200,000
 (If any, prior total est. cost: none)
 (Grand total after adding this action: _____)

2. The members of this committee, and their findings are specified below:

<u>Office</u>	<u>Name/Signature</u>	<u>Date</u>	<u>Endorsed</u>	<u>Not Endorsed</u>
AFR/TR/ARD	Marc Winter	3/29/85	<i>Marc Winter</i>	
ASIA/TR	Charles Antholt	3/29/85	<i>[Signature]</i>	
LAC/DR	Albert Brown	3/29/85	<i>[Signature]</i>	
NE/TECH/AD	Wilber Thomas	3/29/85	<i>[Signature]</i>	
PPC/PDPR	Donald McClelland	3/29		<i>[Signature]</i>
S&T/AGR	Anson Bertrand	3/29	<i>[Signature]</i>	
BIFAD/s	John Stovall	3/29/85	<i>[Signature]</i>	

3. It is the decision of this Committee that this project be:

ENDORSED NOT ENDORSED

SIGNATURE *J. S. Robins* Date 3/29/85
 J. S. Robins
 S&T/FA
 Chairperson

Any dissenting opinions are attached.

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE

A

A ADD
C CHANGE
D DELETE

PP

2. DOCUMENT CODE
3

3. COUNTRY ENTITY

S&T/AGR

4. DOCUMENT REVISION NUMBER

Original

5. PROJECT NUMBER (7 digits)

936-4136

6. BUREAU/OFFICE

A. SYMBOL B. CODE

10

7. PROJECT TITLE (Maximum 40 characters)

Collaborative Research: IARCs

8. ESTIMATED FY OF PROJECT COMPLETION

fy 90

9. ESTIMATED DATE OF OBLIGATION

A. INITIAL FY 85 B. QUARTER 3
C. FINAL FY 89 (Enter 1, 2, 3, or 4)

10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$) -

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL	200		200	4200		4200
(GRANT)	(200)	()	(200)	(4200)	()	(4200)
(LOAN)	()	()	()	()	()	()
OTHER U.S.	1.					
	2.					
HOST COUNTRY						
OTHER DONOR(S)						
TOTALS	200		200	4200		4200

11. PROPOSED BUDGET APPROPRIATED FUNDS (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY 85		H. 2ND FY 86		K. 3RD FY 87	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) FN	1411	953		200		1,000		1,000	
(2)									
(3)									
(4)									
TOTALS				200		1,000		1,000	

A. APPROPRIATION	N. 4TH FY 88		O. 5TH FY 89		LIFE OF PROJECT		12. IN-DEPTH EVALUATION SCHEDULED
	P. GRANT	Q. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN	
(1)	1,000		1,000		4,200		MM YY 0 8 8 7
(2)							
(3)							
(4)							
TOTALS	1,000		1,000		4,200		

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PIO FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PIO FACESHEET.

1 = NO
 2 = YES

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE

TITLE

Anson R. Bertrand
Director, S&T/Agriculture

DATE SIGNED

MM DD YY

15. DATE DOCUMENT RECEIVED IN AID/W. OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM DD YY

COLLABORATIVE RESEARCH ON SPECIAL CONSTRAINTS FOR INTERNATIONAL
AGRICULTURAL RESEARCH CENTERS

(936-4136)

Project Paper

COLLABORATIVE RESEARCH ON SPECIAL CONSTRAINTS FOR INTERNATIONAL
AGRICULTURAL RESEARCH CENTERS

(936-4136)

Project Paper

March 6, 1985
Bureau of Science and Technology
Office of Agriculture

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PROJECT PAPER

Collaborative Research on Special Constraints for International Agricultural
Research Centers (936-4136)

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	Project Annexes, as follows:
	(A) Technical Annex
	(B) Economic Annex
	(C) Administrative and Financial Annex
	(D) Work Plan of Estimated Costs and Contract Budget
	(E) Log Frame Matrix

I. Project Authorization

ENTITY: Bureau for Science and Technology

PROJECT TITLE: Collaborative Research on Special Constraints for International Agricultural Research Center

PROJECT NUMBER: 936-4136

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the centrally funded project entitled: "Collaborative Research on Special Constraints for International Agricultural Research Centers". The project involves planned obligations not to exceed \$4,200,000 of grant funds over a five-year period from FY 1985 through FY 1989 subject to the availability of funds, in accordance with the A.I.D./OYB/allotment process, to help in financing foreign exchange and local currency costs for the project.
2. The purpose of the Project is to support cooperative and joint research funded through grants to U.S. research institutions or scientists to overcome specific obstacles to technological breakthrough at the International Agricultural Research Centers (IARCs) and which the IARCs lack the capacity to address alone. The program will be implemented by the USDA Cooperative State Research Service (USDA/CSRS) through a Participating Agency Service Agreement (PASA).
3. I hereby determine that this proposed agreement is exempt from the provisions of Circular A-76 because: 1) it is for the provision of technical assistance; and 2) the facilities and resources of USDA/CSRS are particularly or uniquely suitable for the technical assistance to be provided and not competitive with private enterprises.
4. Source and Origin of Goods and Services
 - a. Each developing country where assistance takes place under this project shall be deemed to be a cooperating country for the purpose of permitting local cost financing.
 - b. Goods and services, except for ocean shipping, financed by A.I.D. under the project shall have their source and origin in the cooperating country or in the United States except as A.I.D. under the project shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States.

J. S. Robins
 Agency Director for Food and Agriculture
 Bureau for Science and Technology

Clearances: S&T/AGR: ARBertrand _____ Date _____
 S&T/PO: GEaton _____ Date _____
 S&T/MGT: MThome _____ Date _____

ii. Project Summary

a. Statistical

Project Title: Collaborative Research on Special Constraints for International Agricultural Research Centers

New or Extension: New

Contractor and Address: USDA Cooperative State Research Service (CSRS)

Principal Investigators: Researchers from U.S. research institutions to be determined by a scientist peer selection panel.

Duration: Five years

Total Estimated Cost: \$4,200,000

FY 85	\$ 200,000
FY 86	\$1,000,000
FY 87	\$1,000,000
FY 88	\$1,000,000
FY 89	\$1,000,000

Project Manager: Anson Bertrand
James L. Walker

b. Summary Description of Project:

Research efforts by International Agricultural Research Centers (IARCs) often reach an impasse and information cannot be generated on how to improve food production because the IARCs lack specialized facilities, such as highly technical, costly equipment, or specifically trained personnel. In these instances where bottlenecks occur, the IARCs' research efforts need help. There are many U.S. institutions which are uniquely qualified to assist IARCs in solving those problems. If an IARC cannot solve a special research problem, a U.S. institution, with interests similar or parallel to the IARC, will be selected and awarded a grant to assist the IARC. Generally, these special research problems should be solved within two years. No research grants are intended for longer than three years. The USDA/CSRS will carry out this program for A.I.D. under a PASA.

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III. PROJECT RATIONALE AND DESCRIPTION

- A. Background and Rationale: AID is committed to encouraging and fostering global networks of mutually supportive research, information and technical assistance in priority areas, especially agriculture. As indicated in AID Policy Determination No. 47, "Networks are being encouraged to achieve critical massing of resources and efforts for breakthroughs on the important LDC problems." Coordinating or networking resources 1) achieves economies in the utilization of human and capital resources and 2) builds knowledge on common problems at widely separated locations that is mutually reinforcing.

Strengthened intersystem linkages could greatly increase the effectiveness of those individuals and institutions making up the worldwide agricultural research network. That network includes the International Agricultural Research Centers (IARCs), universities throughout the world and research institutions in the United States and abroad.

A 1980 CGIAR report notes a slowdown in the rate of growth in the international agricultural research system; enumerates a number of gaps in research programs; indicates that developing countries and international centers rely heavily on developed countries for generation of scientific knowledge and ideas; and stresses the need for more back-up help, especially in basic research.

The United States at this time contributes 25 percent of the IARCs' core budget and also provides grant funds for U.S. universities to work abroad. Funds available for agricultural research are finite; it is crucial that utilization of existing funds be maximized. One method of improving efficiency is through increased linkages between U.S. research institutions and IARCs.

Furthermore, cooperation between IARCs and U.S. research institutions is presently modest and based largely upon small informal networks between center researchers and a few U.S. scientists. Present efforts tap only a very small fraction of the human and other resources available within U.S. institutions. U.S. scientists are not always aware of the unique contributions they can make to enhance research efforts led by scientific colleagues working at the IARCs. All parties will benefit by increased interaction within the international research network.

U.S. scientists involved in the program will, in nearly all cases, be from public and private universities, non-profit research institutions and the USDA. Biological, physical, social and engineering scientists will be eligible to participate.

- B. Project Goal: The goal of the proposed project is to increase agricultural production and food availability in LDCs through the research programs of the IARCs. The project will support increased collaboration, communication, and coordination within the international research network. The proposed project will concentrate on bottlenecks affecting critical aspects of food production and farming systems which inhibit technological breakthroughs in IARCs' programs. Output of the project will be measured by the ability of the IARCs to produce a range of agricultural technology components (commonly labeled scientific breakthroughs) that can be used by developing countries to increase agricultural productivity.
- C. Project Purpose: The project purpose is to overcome specific obstacles to technological breakthroughs at the IARCs which the IARCs lack the capacity to address alone. This will be accomplished through cooperative and joint research funded through grants to U.S. research institutions or scientists.
- D. Project Activities: Under the proposed project small, discrete cooperative research activities will be initiated between scientists at U.S. institutions and IARC scientists. Research findings will provide essential knowledge or methodologies that will lead to greater output of production technologies by the IARCs. The project will also contribute to enriching U.S. professional capacity in tropical and subtropical agriculture.

Grants will normally be made to U.S. research institutions or scientists; they will be short-term (2-3 years) and total costs will range from \$10,000 to \$135,000. (See Appendix D for models.) No project would be funded unless the IARC and the AID Grants Recommendation Committee (GRC) concur on the significant need for the proposed research on a special constraint at a given IARC. The Cooperative State Research Service of USDA (USDA/CSRS) will implement this program through a PASA.

There are several advantages to a small grants program:

- (1) More scientists will be working on basic research problems, leading to better chances for a greater number of successful breakthroughs.
- (2) AID will get a higher return for its investment. These studies will be targeted so that larger problems can be attacked in small, discrete projects with little or no new equipment requirements. There will be a match between the time available to U.S. scientists and their commitment to international research needs.
- (3) More aspects of problems can be attacked through small grants to several specialized researchers than by a large grant to a single institution.
- (4) Greater flexibility will be provided in research support.

(5) The program will stimulate research pertinent to specific center needs.

(6) Opportunity will be established for collaborative research between scientists at U.S. institutions and scientists at the IARCs.

Proposed research activities must contribute to the realization of intermediate and longer term goals directly related to on-going IARC programs as well as AID's plans for research on a regional and global basis. Research undertaken must support IARC scientific tasks which the IARCs cannot complete alone. Finally, emphasis will be upon research in areas in which U.S. research institutions have a comparative advantage.

Research will be of three types:

- Study of specific problems encountered by the IARCs in their programs;
- Development of new knowledge to allow IARCs to enhance the scope of their programs;
- Development of research methodology, including laboratory work.

The first-hand knowledge of the IARCs permits them to accurately identify, quantify and prioritize research problems. Furthermore, the IARCs can pin-point specific basic research bottlenecks that are delaying the generation of food production technology components for LDC application. But the centers cannot develop all of the capacity required to carry out complete multidisciplinary programs on all problems related to their research. They have limited staffs-- especially in any one discipline. Their research facilities and budgets are tailored to specific objectives so programs are not very flexible. Most centers have neither the time nor resources to develop any but essential knowledge needed immediately for the production of better technology. Further, it would not be the best use of scarce resources for the centers to invest in the specialized personnel and equipment needed to solve all of their short-term problems. U.S. research institutions can fill these gaps.

Research will be conducted by U.S. scientists, postdoctoral fellows and graduate students either at research institutions in the U.S., at the IARCs, or at equally appropriate sites. It is expected that a large proportion of the research will be done at U.S. universities because of their technical personnel and facilities. Studies will be oriented to tropical and subtropical conditions and to priority topics already supported by core budget programs at the IARCs.

The project proposes a highly effective and efficient mode for obtaining research information of high scientific merit from a large, scattered, highly specialized group of international scientists.

- E. Project Sites: This project is not site-specific. Research sub-activities will take place at numerous sites but will be concentrated at U.S. research institutions and the several IARCs (see Annex C, Table C-4 for a list of these centers).
- F. Participants and Responsibilities: AID staff, IARC directors, U.S. research institutions, USDA/CSRS, and members of peer review panels will work together to develop and implement this program (See Section V, p. 7 for the detailed implementation plan.) In general, approval of proposed research will be based on two criteria: (1) the magnitude of the constraint to agricultural production in relationship to a specific IARC program and probability of impact, (2) the capacity of the proposing U.S. institution or individual to complete the proposed research activity.) A GRC, whose membership will include the A.I.D. project manager and representatives from the Agricultural Sector Council, will provide oversight and guidance to USDA/CSRS in carrying out the project. Peer review panels will be set up to provide scientific counsel to the GRC. The GRC will base its approval of grant awards on the recommendations of the peer panel and the reaction of the appropriate IARC Director to the research proposal.

As a first step, AID will ask the IARC Directors to identify high-priority agriculture research topics that promise payoff from modest investments to overcome specific constraints in their programs. The GRC will prioritize these topics, and CSRS will invite preproposals on a reasonable number of topics. (Additional topics can be added during subsequent invitations.) The peer panel will recommend to the GRC those which should be invited to submit full proposals. The GRC will act on the peer panel recommendations and CSRS will ask those approved to develop full proposals. The peer panel will review the full proposals and submit recommendations to the GRC. The GRC will act on the recommendations and AID will authorize the grant awards. Before making the award, CSRS will send the proposals to the appropriate Center Director to see if the Director has any objection to the proposed research.

After receiving the Directors' responses and AID approval, CSRS will award the grants. CSRS will see that the proposed research is undertaken and implemented in a timely fashion.

- G. Direct Beneficiaries: The proposed research program will be utilized when a center encounters a bottleneck or an apparent opportunity for a research breakthrough in one of its programs.

The research projects undertaken will bridge specific research needs by utilizing U.S. scientific excellence that will be put on-call as a result of this AID-funded program. This will keep the center programs on course, make them more productive, and will save them from having to choose between making either unnecessary investments in core scientific talent and equipment or to miss targets of opportunity for research.

Thus, the direct beneficiaries will be the IARCs and their individual programs. U.S. research institutions and scientists will also directly benefit from having an open window on the developing world through IARCs in which they can test and refine methodologies and materials quickly and far more efficiently than is now possible. The collaborative results will be synergistic.

H. Indirect Beneficiaries: This project will contribute to A.I.D. objectives by helping LDC small farmers produce more nutritious food through developing technically improved alternatives to their present practices. It will help insure AID's financial donation to the network of IARCs by providing an efficient and cost-effective source of part-time expertise and instrumentation. Thus, the need for a Center to make additional investments in specific scientific expertise will be eliminated. It will expand the cadre of U.S. scientists with relevant experience in dealing with the research problems affecting the LDCs. And, it will speed the delivery to the LDC national research systems of improved technology developed by the centers to overcome agricultural production problems. The IARCs' programs are targeted at all of the LDCs that are AID's clientele. This knowledge of how to overcome the factors limiting farm production can help these national institutions aid their farmers in more effective ways.

I. Examples of potential contributions by participating scientists:

While specific research will be identified as the program is underway, some general examples of the broader areas of need can be presented, though these are by no means inclusive.

1. Example of Specific Problem:

An IARC will need biochemical "fingerprinting" of a collection of seeds of a large number of accessions of food crops for its program. Visual screening cannot reduce the numbers of seeds to those that are of most interest to the program. These may be seeds that produce more stress tolerant plants which are higher in amino acid content. Screening needs to be done to eliminate duplicate or undesirable accessions prior to the start of research at the IARC. Specialized laboratory equipment and techniques are needed, which are costly and not usually available at IARCs, in order to discover the most promising accession to test in the field. The Nutrition or Plant Biochemistry Department at a U.S. university might be able to do this quickly for the IARC. Sampling, treatment, analytical methodology, and interpretation study would probably all be required for this one-of-its kind research.

2. Example of New Knowledge:

In most crop production situations plant productivity is often constrained by the lack of water in the root zone. In attempts to overcome this limitation, billions of dollars are regularly invested in irrigation systems. Farmers use diverse and imaginative

procedures to increase infiltration of water into, and decrease evaporation from, soils. Although there appears to be great variation among plant species regarding water extraction and use efficiency, the heritable variation for these factors within a species and their relationship to crop yield merits more attention.

Most of the water absorbed by plants does not become part of a plant product but simply passes through the plant and into the air. Under some conditions the rate of entry of carbon dioxide into a plant limits productivity. A reduction in transpiration reduces water use per unit of leaf area, thus allowing greater plant populations per area of land or for longer growth duration.

In many agroclimatic situations there is a high probability that some water stress will occur at specific times. Many crops are especially sensitive to low water availability during flowering and fruiting stages. Less-than-optimum water supply during those periods cuts yields. Drought occurs at other times too, and there seems to be within-species variation in the ability to withstand drought during the seedling and vegetative stages of growth. Study of this growth-stage related stress tolerance and its relationship to yield characteristics may provide important planting materials for IARC programs.

Some important questions to be answered include: How much heritable variability is there in water use efficiencies within major crop species and how can that variability be identified efficiently? How can the heritable variable for resistance to water stress during specific growth periods be identified and used? What physiological processes or morphological characteristics control such resistance and how are they inherited? If answers to any of these basic questions can be found for specific crops, substantial breakthroughs will result.

3. Example of Research Methodology:

Pulse crops (grain legumes) are important foods for many Asian and African people. They contain about 25 percent protein, and along with a few green vegetables, often supplement a cereal-based diet. The amino acid content of pulse crops generally complements and completes diets, but can cause a dietary imbalance when sulfur-containing amino acid contents are low in the grain. The amount of sulfur-containing amino acids varies among crop species, but measurement of these amino acids with present methods is time-consuming and expensive. There are thousands of genetic strains in existing pulse germplasm collections and they need to be screened for high levels of sulfur-containing amino acids.

Although it would produce less-than-perfect information, a rapid and inexpensive technique for quantitative determination of all sulfur-containing acids would greatly enhance ability to develop pulse crop varieties that are relatively high in amino acids. Research would require relatively sophisticated biochemical and physiological determinations and might involve tracer techniques.

IV. Cost Estimate and Financial Plan:

Proposed expenditure of AID funds for the next 3 years is \$2,200,000; total for life of the project \$4,200,000. (See budget on page 8).

V. IMPLEMENTATION PLAN:

A. Expected Accomplishments and Achievements:

The identification of special constraints that hinder the IARCs' ability to generate the research and methodologies needed to overcome food-related problems in the LDCs will be systematized. Accelerated technological breakthroughs in agriculture will be generated by supporting collaborative research on these special constraints by U.S. research institutions and the IARCs. Specific breakthroughs are expected in the biotechnology, food animal production, renewable natural resources and crop production areas. These outputs might include, among others, methodologies for producing and testing of stress-tolerant plants for food, fiber and fuel production; embryo transplants and transplant techniques for food animals; biological nitrogen fixation techniques for non-legumes; monoclonal antibody techniques for disease-free plant and animal production; biochemical soil modification for pest control; rapid bio-assay screening techniques for the identification of promising cultivars; and improved nutritional assay methodologies leading to biochemically superior crops and plants for human consumption.

B. Summary of the Project Implementation Process:

Problem Area Identification

Project manager (S&T/AGR) provides project supervision and coordination for the entire program.

Project manager (S&T/AGR) collects list of research needs from Center Directors and, following evaluation and prioritization by the Grants Recommendation Committee (GRC), submits it for review and approval by the Director, S&T/AGR.

Announcement of Program, Preproposal Review and Approval

Research contractor (USDA/CSRS), upon receiving approved list of research needs from the project manager (S&T/AGR), distributes the research needs list and invites pre-proposals from the network of U.S. research institutions. USDA/CSRS will be directed to the provisions of the Gray amendment and encouraged to make certain that HBCUs and minority and disadvantaged businesses, other than 8a firms, are aware of this program.

Pre-proposals are collected by the research contractor (USDA/CSRS) and submitted to peer review panels. The peer panel recommends to the GRC those to be developed into full proposals. GRC submits its recommendations to the Director, S&T/AGR, for AID's final approval.

PROPOSED BUDGET

<u>Total Funds</u>	<u>Funding (FY 85) Period</u>	<u>Funding (FY 86) Period</u>	<u>Funding (FY 87) Period</u>	<u>Funding (FY 88) Period</u>	<u>Funding (FY 89) Period</u>
FR: 08-1-85	FR: 08-1-85	FR: 08-1-86	FR: 08-1-87	FR: 08-1-88	FR: 08-1-89
<u>TO: 09-30-90</u>	<u>TO: 07-31-86</u>	<u>TO: 07-31-87</u>	<u>TO: 07-31-88</u>	<u>TO: 07-31-89</u>	<u>TO: 09-30-90</u>
Research grants \$3,780,000	\$ 180,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000
Technical Services of USDA/CSRS <u>\$ 420,000</u>	<u>\$ 20,000</u>	<u>\$ 100,000</u>	<u>\$ 100,000</u>	<u>\$ 100,000</u>	<u>\$ 100,000</u>
\$4,200,000	\$ 200,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000

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The pre-proposals judged to be of the highest merit are returned to USDA/CSRS who then issues the invitation that they be developed into full proposals.

Proposal Review and Approval

The research contractor (USDA/CSRS) receives the full proposals and submits them the peer panels for review and submission of recommendations to the GRC. The GRC reviews the proposals and peer panel findings and submits final recommendations for approval by the Director, S&T/AGR. These proposals are then sent to the appropriate Center Director to see if the Center has any objections to the proposal.

Grant Award and Implementation

After the Center Director indicates there is no objection, approved proposals are processed by USDA/CSRS for the award of grants in accord with the AID-USDA/CSRS agreement.

USDA/CSRS administers the grants, commits funds and provides financial management and day-by-day administration, supervising progress and receiving administrative and technical reports in close collaboration with the AID project manager (S&T/AGR).

In collaboration with the project manager and the GRC, when necessary, USDA/CSRS manages the administrative and technical evaluation of the grants. The procedures outlined above will be followed to award the grants for the proposals selected by the competitive process. Detailed work and financial plans will be obtained for each grant to a U.S. research institution following practices required by USDA/CSRS under P.L. 89-106 grants. These are similar to those used by AID.

Grant funds will be used to cover salaries, fringe benefits, travel, services and expendable supplies. Relocation and living costs, if any, will also be covered. Overhead costs of U.S. institutions only will be covered and will be limited to the amount allowable for P.L. 89-106 grants made by USDA/CSRS. Such overhead will apply only to the portion of projects conducted at U.S. institutions, since the IARCs will provide most of the infrastructure needed for research conducted at Centers. No grant funds will be used for construction, and equipment purchases are limited to items of \$1,000 or less since the program is based upon the premise that the U.S. research institutions selected have not only the scientific personnel but also the facilities and equipment needed to carry out the research. Exceptions may occur to this generality but they are expected to be few.

Provisions under the grant for housing and food and, reimbursement for relocation and living costs to U.S. research institutes' (USRI) scientists posted to a Center will be in line with the established policies of the Center to which the scientist is assigned.

C. Project Process

The project is designed to meet specific needs of the IARCs through linkages with scientists/disciplinary units in various U.S. institutions, primarily universities. A rolling grant design has been adopted because the nature of the problems to be addressed, and the modes of operation, ranging from technology applications to basic research, are so diverse.

The research contractor will be the USDA/CSRS^{1/}. This organization has legal authority to perform such tasks, excellent access to the public and private sector U.S. agricultural research institutions, tested and efficient granting mechanisms, successful experience in administering research grants programs that have been funded by S&T/AGR and its precursors, in-depth scientific resources in agricultural and related sciences; and, low (about 10%) overhead costs.

USDA/CSRS will be able to receive and administer research grants in international agriculture that match the needs of the IARCs with the requirements of AID and with the interests and capabilities within U.S. institutions. Under the guidance of the S&T/AGR project manager, the research contractor will secure research proposals, collaborate in their evaluation and provide oversight, reporting and evaluation of subprojects. Since most projects will be of relatively short duration, direct review and monitoring by the AID project manager will be at a minimum, but active involvement of the research contractor will assure responsible administrative management of the project. If a project is being considered for funding beyond three years, extensions will be based on a GRC review of performance and peer review, if appropriate. Continuation of any project would require concurrence of all parties involved in its operation, including the Centers. This is due not only to the complex nature of the research under consideration but also to the substantial financial contributions provided by all concerned. The Centers will provide the U.S. scientists all the facilities required in order to perform the research at the Center; they will also provide Center scientist-collaborators at no cost to the project. The U.S. universities will provide release time from on-going duties to scientists receiving grants under this program. The combined contributions will at least match the total cost to AID of the grants program.

1. Problem Area Identification

S&T/AGR's project manager will provide general supervision and coordination for this project. The manager will solicit from IARC Directors a list of priority research constraints. A brief discussion of how the constraints might be alleviated will be requested from the IARC Directors as well. The GRC will prioritize these topics and AID will furnish an approved list of research topics to CSRS. CSRS will solicit preproposals from U.S. research institutions and individuals on a reasonable number of topics in terms of funds available for grants and workload implications of a high response rate. Additional topics may be added during subsequent rounds.

1/ See annex C for legislative detail.

2. Preproposal Review and Approval

USDA/CSRS, in consultation with the GRC, will establish scientific peer review panels to review the preproposals on the basis of their scientific merit and innovativeness and their contribution to AID's agricultural research goals, the improvements of institutional capacity, and the establishment of improved linkages between the IARCs and U.S. institutions.

All parties involved in the review and screening process for both preproposals and full proposals will use the following criteria as guidelines:

1. Extent to which proposed research directly contributes to attainment of program goals of participating Centers and to AID's research goals.
2. Extent to which participating Centers have constraints that prevent them from completing proposed research without outside assistance
3. Extent to which proposed research is manageable within the time and budget proposed.
4. Capability of institutions conducting proposed research, especially the capability of scientists undertaking the research.
5. The extent to which proposed activity will interface with research already underway at the Centers, in U.S. research institutions, in other developed countries, or LDCs.
6. Extent to which proposed research will address a constraint that affects the present or potential well-being of a significant number of people in developing countries.
7. Potential impact of the research on institutions in other developed countries or in LDCs.
8. Commitment of proposing institution to research in international agricultural development.

The peer panels will submit their recommendations to the GRC. The GRC will consider the scientific findings of the peer panel together with the above criteria in preparing its recommendation for the Director, S&T/AGR on the preproposals which should be invited to submit full proposals.

3. Proposal Review and Approval

Peer panels will again review the full proposals which are submitted as a result of the initial screening process and submit their findings to the GRC. The proposals will be evaluated according to both the above criteria and conformity with research objectives, methodology, feasibility and cost-effectiveness. The GRC will also review the proposals, using the peer panel recommendations as the scientific basis for developing a prioritized listing of those proposals approved for grant awards. Before AID gives its final approval to the recommendations, the proposals will be sent to the appropriate Center Directors to see if there is any objection to the final proposal. After the Directors respond, AID will submit its approved list of proposals for grant award to CSRS.

4. Grant Award and Implementation

After the Director, S&T/AGR, approves the Grants Recommendations Committee submission, the research coordinator (USDA/CSRS) will issue a grant document for the research to be completed as well as services to be rendered in association with the research in accord with the AID-USDA/CSRS agreement. These will follow a standardized procedure for subagreements with U.S. institutions under the authority of P.L.89-106 as amended. Proposing institutions must be U.S. but may be either public or private. Detailed work plans and a budget will be included in each grant (see Annex F for sample formats.) Work will be conducted by qualified scientists but they may be assisted by graduate students and laboratory technicians associated with their institution. Investigations will be conducted in laboratories, greenhouses or other facilities available to the institution and at the IARCs as agreed to by a simple written memorandum of agreement between the institution awarded the grant and the IARC. Purchase of non-expendable equipment under grants will be strictly limited and, if purchased, will be a relatively minor percentage of funds provided under each grant. Funds awarded by USDA/CSRS will identify AID as their source. Each grant must be signed, reviewed and evaluated by the AID S&T/AGR project manager. All travel outside of the United States, its territories or possessions may take place only with the prior authorization of the S&T/AGR project manager.

After the award of a grant for a specific research service, proposals for supplemental research by the same contractor on the same problem will be evaluated by the GRC to assure continuing conformity to research objectives, research design, methodology and feasibility by procedures as set out in the preceding paragraphs.

5. Program Management: The technical direction and managerial functions of this project will be the joint responsibility of S&T/AGR and of the USDA/CSRS. A total of six person-months per year of technical services of an agricultural scientist with experience in the biological sciences and, preferably, tropical overseas experience will be required. The role may be divided between two scientists where that would be appropriate to obtain the breadth of experience appropriate. The Program Manager(s) will be provided funds for official travel required in administering the grants. Prior to its initiation all overseas travel by USDA/CSRS scientists or by grantees must be authorized by the S&T/AGR Project Manager.

USDA/CSRS will manage and administer the project and its U.S. sub-agreements under the authority of, and in accordance with, 22U.S.C. 2392(a) or 22U.S.C. 2395(b) and in accordance with appropriate USDA/CSRS practices.

6. Support Services: USDA/CSRS will provide both administrative and secretarial support for the Program in performance of project duties. Nine person-months per year of secretarial services will be required for this function.

VI. Evaluation and Technical Review: The U.S. investigator(s) must summarize all research grant results annually on CRIS report forms. These reports will serve as a basic part of the review process. Each grant's Principal Investigator will also prepare a short (5 pages) annual report of research progress that will be submitted to the USDA/CSRS Program Manager and to the S&T/AGR Project Officer. Principal Investigators are expected to present oral reports at program-sponsored workshops and during on-site visits by the Program Manager and/or Project Officer.

In addition to the above, the project will be reviewed and evaluated by the AID Program Manager and/or Project Officer assisted by research and management consultants at intervals both at Washington and at the location of the research investigators with subagreements. An in-depth evaluation will take place in FY 1987.

In the fourth year of the program, a similar evaluation team will be retained to conduct a thorough and objective evaluation of all phases of the program to determine its effectiveness in meeting its objectives. This analysis will be used in making decisions about the future of the program.

VII. Reports and Research Results:

USDA/CSRS will prepare an annual report on the project's activities and results. Twenty copies of the annual report will be provided to the AID S&T/AGR project manager within 90 days after completing each 12 months of project activities. Quarterly reports will also be made. Neither AID nor the USDA/CSRS will publish results of research activities without consulting the other. Credit will be given to sponsoring agencies and to the individuals responsible for doing research under the grants, but participating scientists may publish results of their research only after approval by AID as stipulated in Federal Procurement Regulations, Chapter 7 and HB 41.

USDA/CSRS will submit three copies of all reports listed as being a product of the contract (administrative, progress, final, and technical report, etc.) to the Publication and Information Division, S&T/PI, Agency for International Development, Washington, D.C., 20523, or his designee.

These reports shall include a title page showing the title of the report, project title and number as set forth in the subagreement under P.L. 89-106, as amended. One copy of each report shall be clearly typed or printed on white paper so that it may be photographed to produce a microfilm master. Technical reports shall be accompanied by an author-prepared abstract.

Reports of each grant made under this project shall be submitted by the U.S. investigator on the appropriate CRIS form (supplied by USDA/CSRS) with copies to the S&T/AGR Project Officer.

Trip Reports: After completion of each TDY assignment overseas by grantees, as well as by USDA/CSRS personnel, a trip report will be prepared giving general itinerary, people contacted, accomplishments and suggestions resulting therefrom. Copies of the report will be sent by the USDA/CSRS and/or grantees to the S&T/AGR AID Project Officer.

VIII MONITORING PLAN:

Successful operation of the program requires that policies and procedures be agreed to by all parties involved. AID will have responsibility for monitoring the progress, scientific quality and orientation toward AID's interests by the program. The program requires 4 person-months per year S&T/AGR AID project manager (scientist/administrator) with a part-time 4 person-months per year secretary. USDA/CSRS will provide day-to-day support and record keeping associated with the project.

TECHNICAL ANNEX A

The purpose of this Annex is to review the technical feasibility of undertaking the proposed project. It first discusses the proposed program and rationale for it, then compares the proposed activity with ongoing activities of a similar nature. It concludes by describing in detail what will be accomplished and confirms that the proposed activity will provide research services not supplied by other activities. In the first section other activities are described in considerable detail.

Targeting the Project

This project allows the U.S. institutions together with the IARCs to accurately focus the massive, complex and expensive U.S. institutional research resources upon removing the basic research constraints hindering the IARC's applied research programs. It is intended to do so in a highly articulated, specific and cost-effective manner by linking the vast U.S. institutional scientific and technological research capacity to specifically identified basic components of the IARC system.

Nature and Rationale of the Proposed Research

This project is to fund basic research specifically targeted at removing constraints to the implementation of IARC programs. The research is to be largely done utilizing U.S. institutional research capacities that do not exist at the IARCs. It is expected that most of the research will be done in the U.S. institutions with a minimum of travel and presence of U.S. scientists at IARC locations. The approval process for research proposal funding will include a statement from the Center Director containing the following elements:

- demonstration of the important need for the specific research;
- demonstration that the center lacks the capability of conducting the research itself;
- urgent reasons why the research should not be supported from the centers' core budget.
- nature of the centers cooperation in the proposed research, including the value of that cooperation as a component of the proposed research effort.

None of these elements are present in other AID-funded Small Grant Activities. Other important differences exist, as described in the following section:

Relationship with Other AID-Funded Small Grant Activities (NAS, Science Advisor, S&T Small Activities, Regional Bureaus PD&S Funds).

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NAS and Science Advisor's Research Grants. This is a congressionally-mandated AID activity with an LDC scientist/institution focus intended to:

- involve LDC scientists and institutions in priority setting, scientific planning, information exchange and technology transfer;
- assist LDCs to build scientific and technical capacities to support research on development problems; and,
- stimulate and support new and innovative research approaches to current or emerging development problems.

Science Advisor's funds cannot be used to support projects being funded by other components of AID. U.S. institutions' participation in the NAS and Science Advisor's Research Grants, with few exceptions, must be linked with LDC scientists and institutions. The Science Advisor's grants are for unsolicited research proposals while the NAS grants, which are managed by BOSTID, are for invited proposals exclusively from LDC institutions. Given the nature of the Science Advisor's mandate, it would be inappropriate to utilize Science Advisor's funds to support the research proposed under this Collaborative Research on Special Constraints (CRSC) program.

S&T Small Activities. This is very modest in size. It is used to cover all S&T program areas and is not restricted to research. State-of-the-art studies, special consultations and small workshops are typical activities. A characteristic of this fund is that it gives the Bureau a capability for quick response to unanticipated high-priority activities. It is conceivable that the S&T Small Activities fund could be used to fund activities such as those proposed in the CRSC program. This, however, would mean that the S&T Small Activities fund be significantly expanded, that its focus be on agricultural research (perhaps to the exclusion of other activities) and that its application be totally or largely subject to the approval of IARC Directors. The latter characteristic is stipulated under the CRSC program.

Regional Bureau PD&S Funds: Regional Bureau program development and support funds are very similar to S&T's Small activities fund. In practice, RBs and USAIDs utilize PD&S funds largely for planning-related activities such as those for laying the groundwork for decisions on whether to prepare PIDs and for the preparation of these and PPs as well as for evaluations. While it is conceivable that PD&S funds, like S&T's Small Activities fund, could be used for activities such as those proposed in the program for cooperative research between U.S. research institutions and IARCs, both the desirability and feasibility of doing so are remote and subject to the same caveats as apply to utilizing S&T Small Activities funds for this purpose.

None of AID's existing portfolio of Small Grant Activities provides a suitable base for funding the specific type of basic research through the kind of closely controlled relationship required for the CRSC program.

Developing the information to alleviate the bottlenecks and to speed the breakthroughs facing the IARCs is essential if effective and economically efficient use is to be made of AID's investment in the core programs of the centers and of their potential benefits in farming systems of the tropics.

What will be done to Assure Research Linkages

This is a proposal for a cooperative research program between U.S. research institutions and the International Agricultural Research Centers. The program will consist of research conducted by U.S. research institutions in cooperation with centers to solve major food problems of developing countries.

Several centers have contractual or other linkages with U.S. universities, research institutes and the USDA. Examples include cooperation between Oregon State University and CIMMYT on spring x winter wheat breeding and screening; University of Minnesota's work with CIP on cold hardiness in potatoes; Cornell's linkages with CIMMYT, CIP and IRRI; Texas A&M's linkage with ICRISAT; and Boyce Thompson Institute's cooperative research with IRRI. Some of the cooperative research has been done on contracts from the centers; some has been funded by the foundations; and the research institutes have used their own resources to support some projects. It is anticipated that these relationships will continue and that such on-going research will not be funded under the USDA/CSRS project unless fully justified under the conditions stated in the implementation plan.

Existing linkages between the IARCs and U.S. research institutions are quite limited in area and in the number and variety of U.S. scientists and institutions involved. Their funding base lacks elasticity for several reasons: 1) shortage of funds available to the foundations; 2) lack of funds at U.S. research institutions to support overseas work; and 3) The IARCs increasing need to allocate all their funds to on-going core budget programs because of inflationary pressures overseas and the "no-growth" caps on their budgets.

Research undertaken to provide these breakthroughs through the small grant is directly related to other projects in S&T/FA. It will provide a framework for a network of these U.S. scientists and their LDC colleagues with the scientists at the IARCs who are working on related problems. U.S. institutions and scientists involved in the Title XII Strengthening Grants, 211-d and the Collaborative Research Support Program have had their capacity to interact with the IARCs on specific research problems enhanced due to their experience on identifying gaps in our knowledge that can be attacked through research under a small grant/services project such as that being proposed.^{1/}

^{1/}Due to the specifically targeted nature of the research it is expected, with few exceptions, to be short-term (3 years or less).

Work under this project will be coordinated with scientists at other U.S. research institutions and outside of the U.S. including International Development Research Center of Canada (IDRC), German Technical Cooperation (GTZ), Swedish Agency for Research Cooperation with Developing Countries (SAREC), Rockefeller Foundation, Food and Agriculture Organization of the United Nations (FAO), United Nations Development Program (UNDP), United Nations Environmental Program (UNEP), Interamerican Institute Cooperation for Agriculture (IICA), Office of Development Assistance of Great Britain (ODA) and the Australian Development Assistance Bureau (ADAB).

Plans to Facilitate Utilization of Scientific Breakthroughs

CGIAR and the Center directors have identified three types of research on which support from developed countries such as the U.S. is needed.

The first is to provide help on specific problems encountered by the Centers in their programs (mission-oriented research).

The second type of research is to develop areas of relatively new knowledge that will allow Centers to enlarge the scope of their programs. For example, a better understanding of the physiological processes that control efficiency of the use of the water and various nutrients in plants might well make possible the selection of much more efficient plants.

The third type of research, mentioned in the 1980 CGIAR report and by others, is back-up research in methodology-- such as research to provide more cost effective methods for conducting field testing of fertilizers and new crop varieties. The Centers especially need help in this case.

The project will stress mutuality of interests between the Centers and U.S. research institutions. The program would focus on the Center problems in which U.S. institutions have comparative advantage by virtue of their scientific expertise, laboratories, equipment and other factors.

Location of research

The location of research will be determined for each sub-project. In determining comparative advantage and division of labor in planning the research, it will be decided what parts of the research could best be done in the U.S. and what parts could best be done elsewhere. In some cases it may be necessary to conduct part of the research at the Centers or in developing countries. In most cases, successful conduct of the research will require occasional travel to the Centers or to developing countries, and in all cases close interaction among U.S., Center and LDC scientists will be expected to carry out the project.

Duration of research

In the proposed project, activities will be supported if they exhibit the potential of leading to progress in achieving intermediate and longer term gains in productivity. Consequently, it is anticipated that many of the subprojects will be completed in one to two years and that normally the projects will not exceed three years in duration. Even if a line of work is progressing well, requests for project extensions would be forced to compete with new project proposals.

Size of project

The emphasis is to be on small projects that involve less than one scientist year per year. It is anticipated that total costs of the grants for back-up research would range from \$10,000 to \$135,000; and that there will be a limited number of larger projects.

Research at U.S. Institutions

It is anticipated that most of the research will be conducted in the U.S. Most of the buildings, laboratories and equipment needed to conduct research will be available at research institutions. More importantly, the key ingredient required for success, the time and insights of senior research scientists, is most readily available in the U.S.

U.S. institutions will be expected to keep international centers well informed of progress on sub-projects. When sub-projects are completed, institutions conducting back-up research will be expected to publish reports of findings. These reports shall be prepared in such a manner as to be of the greatest use to personnel at the IARCs and AID technicians. Publication of results in scientific journals will reach another, larger group of scientists.

Research at Centers

Graduate student dissertations

Some of the back-up research will be done most effectively by having graduate students from U.S. universities conduct their dissertation research at the Centers. The major objective would be to produce research results that are essential to the Centers in accomplishing their missions.

Dissertation research will ordinarily be part of supporting research being conducted in the U.S. by members of the faculty at the participating institution. On infrequent occasions dissertation research will be linked with research of visiting scientists from the same institution. In some instances it may be advantageous to link dissertation research with national research programs of universities near the Centers, or to tie it in with one of the Center's regional offices.

Where graduate student dissertations are the agreed-upon best approach to solving research priorities identified through the process described in the implementation plans, priority will be given to involving Ph.D. candidates.

Frequently, dissertation research can make important contributions to scientific literature, and it is expected that results will be published in appropriate scientific journals. The candidate or his/her university will be responsible for providing Center personnel with copies of dissertation findings. Such reports must be in a form usable by Center staff. In some cases candidates or institutions may assist in preparing publications or in other programs to transmit results to LDCs.

Postdoctoral fellows and visiting scientists

Some back-up research can best be done by postdoctoral fellows and visiting scientists from the U.S. working in research programs at the Centers. The major objective will be to help Centers solve major problems or capitalize on major research opportunities.

Where it is the most effective way to do the needed research, a limited number of mid-career scientists from U.S. institutions will serve as visiting scientists at the Centers. They will be selected from among the most competent agricultural scientists at the U.S. institutions; all will have insights into research that will be valuable to developing countries, and some will have had previous experience in LDCs. They will provide specialized expertise in areas where there is a void or a temporary need on a Center's staff. They will be expected to make significant contributions on carefully specified problems at the Center. They will also be expected to contribute ideas and stimulation to the Center's staff and any postdoctoral fellows or graduate students in residence.

Visiting scientists will also gain insights that may be useful in solving U.S. problems and their future research and teaching. Many of them will probably continue their involvement in international programs. This will contribute to the capacity of the U.S. to assist developing countries with future problems.

Postdoctoral fellows and visiting scientists will be expected to make written informal reports to Centers where they work. Such reports shall include a copy of all of data gathered under the project. Researchers are also encouraged to publish research results in the most appropriate form--scientific journals, reports prepared for use at Centers, and/or reports adapted for use in LDCs.

Annual reports by each grantee will be on the Cooperative Research Information Service (CRIS) forms and these will be distributed to all of the IARCs, to the grantees working in related fields and to AID organizations expressing an interest in the research. Detailed annual reports may be requested by scientists. Terminal reports will be made at the end of each project these will be available for use by interested persons in missions an elsewhere.

The ultimate user of the new technology generated under this program is the smallholder farmer and grazer. However, individual Centers or national programs will be expected to translate, adapt and formulate appropriate publications or other mechanisms assuring that findings are communicated to final users, the farmers in the LDCs. Other mechanisms in USAID missions as well as LDC scientists and institutions will be used to deliver improved technologies to farmers.

ANNEX B.

ECONOMIC ANALYSIS

Economic Justification. Individual Centers in the IARCs network will be the direct and immediate beneficiaries of this project. The network of IARCs, which includes AVRDC and IFDC, encompasses all of the major food crops, and some of the major animal protein sources, necessary for man's survival in the LDCs. Research to identify methodologies or materials that can make living more secure for the majority of the poor in the LDCs and more profitable for the farmers there is the principal tool used by the IARCs in accomplishing their mission. Most of the technology used at the IARCs comes from U.S. research institutions, principally universities. The annual cost to the forty-plus sponsors of the network of IARCs is about \$170 million.

This project, whose average annual cost is \$1 million, is specifically aimed at overcoming special constraints within a center's larger research programs that are slowing down the generation of new technology for LDC producers.

It has been estimated that roughly a third of the programs at the IARCs have such problems. These range from disease/immune reactions and their identification, to soil and water management on certain acid infertile soils in semi-arid climates. A plant/animal virologist with access to a scanning electron microscope might be needed in the first case. A unusually well trained tropical soil scientist could be part of the human resources needed to answer the second problem.

One direct effect of the special constraints research project will be that the work of the IARCs network will be felt much more quickly and by greater numbers of people in the LDCs because the special constraints research project will allow the Centers to expedite what donors expect of them.

It is difficult to quantify the value of economic benefits to be generated. While recent literature attributes extremely high returns to the application of new technology developed through agricultural research, some economists believe these to be unrealistic. This attitude stems in part from a failure to take into account offsetting expenditures for unsuccessful research and for the development of a technology transfer network ^{1/}.

However, the secondary economic results anticipated as a direct result of this project on generating new technology faster by the Centers are that: (1) farmer welfare will benefit through increased net farm income and improvements in factors that are related to quality of life and (2) national income will benefit through increased agricultural output. Improved farmer net income will result from various combinations of new Center-originated technologies to

^{1/} Herford and A. Schmitz, 1977, "Measuring Economic Returns to Agricultural Research" in Resource Allocation and Productivity in National and International Research. ed. by T.M. Arndt, D.G. Dalrymple and V.W. Ruttan, U.Minn. Press

which research on special constraints has contributed, increasing farm production and individual farmer productivity and/or lowering unit costs of production. An important intangible improvement to farmer welfare is expected as a spin-off of the activities in improved planting methods. In addition to bringing income benefits, the drudgery of traditional farming techniques will be reduced. Increased national agricultural output is expected through the intensification of small farmer utilization of the new technologies to which the project has contributed and perhaps by crop substitution and expansion of area cultivated. A longer-range product of this project will be the reduction in national food-product short-falls and a consequent lessening of national dependence upon food aid and volume of hard currency purchases.

IARCs and farmers will profit sizably by investing in research on special constraints. Centers will be able to produce new technology more rapidly. Small farmers will be provided techniques and materials that will increase productivity, reduce risk and/or lower unit costs of production.

In earlier sections of this project paper, there appear to have been a number of areas where special constraints research could have been important to the speed with which these new varieties were developed. Biochemical seed assay techniques for screening out genetic duplicates from among the hundreds of accessions from numerous countries would have greatly reduced the amount and time of field screening required in order to identify the best wheats and rices. Bio-assay methods of selection of disease resistance and plant nutrient utilization efficiencies, among others, would have been valuable in pinpointing varieties having the most desirable agronomic characteristics. Success in any one of these areas might have sped up the appearance of these miracle rices and wheats by a year or more. Such a breakthrough would have been many times more valuable than the total cost of this project.

One area to be included in this project is the application of biotechnology to the solution of special disease constraints affecting the research programs of IARCs. A small example of the potential benefits of special constraints research in this field can be taken from Central America where more than 95% of the rice seed used is of IRRI or CIAT origin. Rice is a new crop in Central America, gaining in popularity only since the early 1960's. Rice Blast, Pyricularia Oryzae, is a disease that seriously affects all of Central America's rice producing area. Nearly all of the rice grown in this 250,000 Ha area is dryland rice. Essentially all of it is grown by small farmers. Yields average 3.5 MT/Ha when rice blast is not a problem. However, it is now nearly always a problem and when it appears, yields are commonly reduced by fifty percent. Since 1974, when farmers could get average yields for three years before having to change varieties, farmers today are very fortunate if they can make more than one crop before having to purchase new seed. A bag of rice seed under a small farmer credit program costs about \$35. It is possible that a monoclonal antibody technique could be utilized to produce rice-blast

resistant seed. IARCs lack the capacity to do such research. However, several research institutes in the U.S. have done pioneering work in this area and have the capacity to focus the techniques on this special problem of the Centers.

For the small area of Central America, the economic benefits of the successful development of blast-resistant rice seed could be significant:

1. Present (prices approximate):
(1.75Mt/Ha @ \$250 per Mt)(250,000 Has)= \$109 Million per year
\$35 bag of seed/2 Has/2 years = \$2 Million per year
2. Projected:
(3.5 Mt/Ha @ \$250 per Mt)(250,000 Has)= \$219 Million Per year
No purchase seed required
Increase in Gross: \$219M -\$107M = \$112 Million per year

The rice growers projected yearly increase in income per hectare would average \$437.50 for the increase in rice production. Production costs would be \$8.75 less for the reduction in purchased seed required if rice-blast resistant seed were available. The total benefit per hectare is calculated at \$446 for a breakthrough on this particular constraint. The value of such an improvement in rice production technology, just for the small rice growing area of Central America, would exceed the total costs of this project on Collaborative Research on Special Constraints for the IARCs.

In conclusion, the project appears to be economically feasible and cost effective, even when the most modest expected increases are used as standards for benefits.

ANNEX C

ADMINISTRATIVE AND FINANCIAL ANALYSIS OF PROPOSED PROJECT

There are two major institutional components in the proposed project: (1) the agricultural research institutions which would receive the AID grants; and (2) the International Agricultural Research Centers which would generally act as hosts for research activities by providing research facilities, housing, etc. for U.S. researchers working at the IARCs.

United States' Research Institutions:

Most of the U.S. research institutions participating in this project will be public, such as state land grant agricultural colleges, experiment stations, and the U.S. Department of Agriculture. However, some private or semi-public institutions will also participate—such as non land-grant colleges, the Boyce Thompson Institute at Cornell, and private colleges and universities. It is not possible to provide a concise administrative and financial analysis for such a broad array of institutions. Moreover, all participating institutions are well established and well known.

The public institutions involved generally will be represented by the Board for International Food and Agricultural Development (BIFAD), a Title XII advisory organization funded by AID. Under the current Foreign Assistance Act, BIFAD has specific responsibilities to certify U.S. universities to work in international agriculture. AID also provides strengthening grants to many of the institutions which will be involved in carrying out the proposed project.

Thus, AID is already familiar with institutions and individuals having the potential to participate in the project and can provide administrative and financial appraisals of individual institutions during the review process for activities undertaken during implementation of the project.

The USDA has lengthy experience in managing similar small grant activities and is authorized to do so under P.L. 97-98 (Dec. 22, 1981), "General Authority to Enter into Contracts, Grants, and Cooperative Agreements". This stipulates that:

"GENERAL AUTHORITY TO ENTER INTO CONTRACTS, GRANTS, AND COOPERATIVE AGREEMENTS

"SEC. 1472. (a) The purpose of this section is to confer upon the Secretary general authority to enter into contracts, grants, and cooperative agreements to further the research, extension, or teaching programs in the food and agricultural sciences of the Department of Agriculture. This authority supplements all other laws relating to the Department of Agriculture and is not to be construed as limiting or repealing any existing authorities.

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"(b) The Secretary may enter into contracts, grants, or cooperative agreements for periods not to exceed five years, with State agricultural experiment stations, State cooperative extension services, all colleges and universities, other research or education institutions and organizations, Federal and private agencies and organizations, individuals, and any other contractor or recipient, either foreign or domestic, to further research, extension, or teaching programs in the food and agricultural sciences of the Department of Agriculture.

"(c) The Secretary may vest title to expendable and nonexpendable equipment and supplies and other tangible personal property in the contractor or recipient when the contractor or recipient purchases such equipment, supplies, and property with contract, grant or cooperative agreement funds and the Secretary deems such vesting of title a furtherance of the agricultural research, extension, or teaching objectives of the Department of Agriculture.

"(d) Unless otherwise provided in this title, the Secretary may enter into contracts, grants, or cooperative agreements, as authorized by this section, without regard to any requirements for competition the provisions of section 3709 of the Revised Statutes (41 U.S.C. 5), and the provisions of section 3648 of the Revised Statutes (31 U.S.C. 529).

International Research Institutions:

The number of international research institutions which will be involved in the project is small compared to the number of participating U.S. institutions. International Centers include the 13 research Centers and programs sponsored by the Consultative Group on International Agricultural Research (CGIAR), and three regional organizations that are not sponsored by the CGIAR. The latter category includes the Asian Vegetable Research and Development Center (AVRDC), the International Fertilizer Development Center (IFDC) and the Tropical Agricultural Research and Training Center (CATIE). AID/S&T provides unrestricted core support to 12 of the 13 CGIAR Centers, AVRDC and IFDC. Individual AID missions and regional bureaus frequently provide project support to Centers in their geographical area. Other International Centers such as the International Center for Insect Physiology and Ecology (ICIPIE), and the International Center for Living Aquatic Resources (ICLARM) receive limited support from AID. An International Irrigation Management Institute is being formed. For a complete list of Centers which could potentially participate in the proposed project see the June, 1981, Acronym List of International Organizations Related to Agriculture, Economic Development and Pest Management.

A common characteristic of all of the Centers, present and proposed, is that each is governed by an international board of directors, receives international funding, and has an international staff. Centers are generally classified as public international organizations in countries where they are located and have international status. Each has a controller or financial manager. In virtually all cases outside, independent auditors are engaged to review annual financial reports.

Centers within the CGIAR system operate under the umbrella provided by that group. This means that at any given time, current members establish general coordination policies. The CGIAR promotes and coordinates most funding activities but individual donors provide funding directly to specific Centers. The CGIAR's Technical Advisory Committee (TAC) provides general technical advice and arranges external technical reviews of each IARC every five or six years. Recently, the CGIAR initiated a program of external management reviews which will be conducted at the same time as technical reviews. The CGIAR has also established uniform procedures for the preparation of annual program and budget presentations for review by the TAC and the CGIAR; these include standardized financial reporting and annual audits. Each Center issues an annual report which summarizes its scientific and technical activities.

In addition to unrestricted and restricted core research activities, centers also carry out "custom-made" research and training projects. These special activities are usually of short duration and bilaterally funded, and country specific.

Individual AID missions and regional bureaus frequently provide project support to Centers in their geographical area.

The first International Center was established in 1960; the CGIAR was created in 1971. Most of the International Centers are, thus, relatively new when compared with research organizations in developed countries. But, they have evolved into a well-known and well-regarded international network. CGIAR oversight is effective and major problems are identified in the annual program and budget reviews as well as in the quinquennial external reviews. As a result, the CGIAR centers are generally well run administratively and financially.

Although a few of the non-CGIAR centers have sometimes endured financial or administrative problems, they tend to have structures adequate for supervising research activities. ICIPIE and CATIE both have had some difficulties in the past; intensive study of these problems resulted in recent corrections in their staff and administration.

Much information exists about the financial and administrative situations of the International Agricultural Research Centers individually and about the CGIAR in general. However, it is unnecessary to pursue these points at great length in this analysis because the IARCs would not be the major direct recipients of funds under the proposed project. Grants would go directly to U.S. research institutions. Rarely, if ever, would portions of a grant be transferred by a U.S. institution to an international center for the performance of specific projects segments. Project accounting will, therefore, nearly always be carried out solely by U.S. research institutions.

Details of Prior and Current AID Funding of IARCs:

From the inception of the CGIAR in 1972, AID has followed a policy of providing approximately 25% of total core funding to the centers. Total U.S. contributions to the Centers sponsored by the CGIAR have grown as follows (millions of dollars):

Table C-1

1972	3.77	1978
21.15		
1973	5.39	1979
24.80		
1974	6.81	1980
29.00		
1975	10.76	1981
35.05		
1976	14.87	1982
40.79		
1977	18.14	1983
43.75		
1984	45.25	

First tranche. Maximum authorized is \$44.0 million.

A breakdown of recent funding by individual CGIAR centers is provided in Table C-2

Table C-2
AID/CONTRIBUTIONS TO CORE BUDGETS OF INTERNATIONAL
AGRICULTURAL RESEARCH CENTERS, 1981-1983

	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
<u>CGIAR Centers</u>				
CIAT	4,350	4,900	5,400	5,600
CIMMYT	5,600	6,550	6,000	6,000
CIP	2,200	2,200	2,300	2,300
IBPGR	800	850	900	900
ICARDA	3,250	3,650	5,000	5,300
ICRISAT	2,900	3,200	4,350	4,850
IFPRI	800	950	1,100	1,400
IITA	4,700	5,935	6,200	6,300
ILCA	2,400	2,550	2,800	3,200
ILRAD	3,100	2,400	2,500	2,500
IRRI	4,300	5,900	6,300	6,000
ISNAR	600	1,000	900	900
WARDA ²	0	0	0	0
Subtotal	35,000	40,785	43,750	45,250
<u>Non-CGIAR Centers²</u>				
AVRDC	700	800	850	950
IFDC	4,000	4,000	4,000	4,000
Subtotal	4,700	4,800	4,850	4,950
Total	39,700	45,585	48,650	50,700

¹WARDA is funded by non-U.S. CGIAR members.

²For non-CGIAR centers, a similar 25% funding formula is followed.
for example, the U.S. contribution to AVRDC was \$700,000 in 1981.

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\$800,000 in 1982, and approximately \$850,000 in 1983. However, in the case of IFDC the U.S. makes a fixed annual contribution of \$4 million.

AID funds are provided for unrestricted core purposes such as basic operating costs of centers and programs. Some donors provide restricted core grants frequently because their statutes prohibit them from providing unrestricted core support. In 1982, unrestricted core contributions represented about 75 percent of the centers' core funding.

In addition, many donors, including USAIDs, provide funds for special projects. Such funds are generally for particular short-term projects in a given country and usually come from bilateral sources. AID regional bureaus sponsored about \$8.0 million worth of such special projects in 1982.

In the case of core funding, nearly all (94.5% in 1983) goes for operations and only a modest proportion (5.5% in 1983) is utilized for capital (equipment and construction). The distribution of operating funds by function was as follows in 1982:

Table C-3

<u>Category</u>	<u>Percent</u>
Research	60
Training and conferences	7
Library and documentation	5
General administration	12
General operations	15
Other; contingencies	1
<u>Total</u>	<u>100</u>

The breakdown of the 1982 research budget by commodity or program was:

Table C-4

<u>Commodity/Program</u>	<u>Percent</u>
Cereals	40
Root crops	10
Legumes	7
Livestock/forage	17
Farming systems	6
Genetic resources	4
Food policy (IFPRI)	2
National research (ISNAR)	2
Other (research support)	12
<u>Total</u>	<u>100</u>

The pattern of distribution has not changed much over the last few years. AID core funds provided to centers are distributed approximately as indicated in Table C-2. Nevertheless, the pattern is often altered in specific cases due to the addition of blocks of restricted core funds.

Potential Value of the International Research System to the United States

Most nations can benefit directly from agricultural research done elsewhere. This is particularly true of nations with well-developed research systems that can adapt other research to their own conditions. Hence, the United States, as one of the world's largest generators and users of agricultural technology, should be in a position to contribute and gain as much as any nation. This is a significant matter considering the need of the U.S. to continually improve its agriculture in order to keep domestic food prices down while maintaining its competitive edge in foreign markets.

General Nature of Benefits

Direct benefits to U.S. agriculture include new and improved technologies that could either be used directly or applied with further modifications. The United States, like other nations, borrowed agricultural technology for centuries. Over time, foreign borrowing came to play a smaller role. When the United States dominated world research, it was felt that there was less to learn elsewhere. But, more recently, many other countries have surpassed us in agricultural growth and the United States can, once again, profitably use technologies developed elsewhere.

The existence of expanded research systems in other developed and in developing nations will contribute significantly to the improvement of agriculture in those nations. From the point of view of the U.S. foreign-assistance program, there is a larger research base from which to draw, both in other developed nations and in international centers. This base provides greater research for use in developing countries.

Improvement of agriculture in developing nations can benefit the United States in several ways. First, as it contributes to economic development, it will improve commercial export markets for U.S. agricultural products. Second, it will reduce the need for United States concessional food aid---which is becoming increasingly expensive as U.S. surpluses disappear. Third, moderation of food prices in other nations may have a tempering effect on food prices in the United States and, fourth, the United States is a major importer of agricultural products. Improvements in agriculture elsewhere can mean lower costs to U.S. consumers.

Specific Examples

Assistance provided by the United States to international research has resulted in improvements in U.S. agriculture.

Wheat

The International Maize and Wheat Improvement Center (CIMMYT) has developed improved wheat varieties which have been of value to the United States in three ways: (1) direct use; (2) as a source of selection made in the U.S.; and (3) as parents in crosses made in the U.S.

In 1974, 22.14% of the U.S. wheat area was planted to semi-dwarf wheat varieties: 25.7% of the total semi-dwarf area was composed of introductions and selections from the CIMMYT/INIA program in Mexico. The use of semi-dwarf varieties of Mexican extraction had greatest impact in the southwestern states, especially in California.

Virtually all of the semi-dwarf varieties, both the Mexican and U.S. extraction, trace their dwarf characteristics to the same source. Other research conducted by CIMMYT, which may not show up in improved wheat varieties, may also be of value to the United States.

Rice

Semi-dwarf rice originated in East Asia, and most of the varieties in use trace their origins to varieties developed at IRRI. These varieties, along with semi-dwarf varieties developed through irradiation of domestic varieties, were used as parents in breeding programs in the United States, particularly in California.

Semi-dwarf rice varieties adapted to U.S. conditions are relatively recent and, to date, have only been used in California. Semi-dwarf rice varieties are under development in the Southern States and may make a contribution there. Of the semi-dwarf plantings in California, half or more were planted recently with a variety (M9) of IRRI parentage (60 percent in 1979 and 50 percent in 1980). It, in turn, represented about 30 percent of the California rice area in 1979 and 37.5 percent in 1980.

California specialists estimate that semi-dwarf varieties increased yields 10 to 15 percent. California yields were at a record level in 1979 (6,520 lb/acre) and next to record level in 1980 (6,440 lb/acre). The 1979 yield was 11.1 percent above the previous high. California yields, in turn, were 41.8 and 46.3 percent above the U.S. average in 1979 and 1980, respectively.

The future will offer many further opportunities for the United States to benefit from research done elsewhere. The major constraint at present is the rather limited U.S. connection with the emerging international research system.

ANNEX D.

WORK PLAN OF ESTIMATED COSTS AND CONTRACT BUDGET

Responsibilities: The three parties have the following responsibilities:

For Research conducted in the U.S.A.

<u>U.S. Research Institution</u>	<u>International Center</u>	<u>USDA/CSRS AID Grant</u>
Salary and fringe benefits for the senior scientists.	Complementary portion of research, if any, conducted at the center	Salaries and fringe benefits for assistants and
Use of land, buildings, facilities, labs equipment, herds and flocks.	Travel of center scientists to the U.S., if needed, to develop or maintain the linkage.	scientific aides, graduate assistants, etc.
Overall planning and management of the program		Travel to and from center and LDCs, where relevant, to develop and maintain linkage.

For Research Conducted at the Centers

For U.S. Research Institution Graduate Students at the Centers

<u>U.S. Research Institution</u>	<u>International Center</u>	<u>USDA/CSRS AID Grant</u>
Overall planning, fiscal management, and supervision of candidate.	Supervision of Graduate student while at the center.	Stipend and fringe benefits for the Graduate student.
	Use of land, buildings, facilities, labs equipment, herds and flocks.	Travel for student and dependents to center and return.
	Expenses in connection with the research at the center.	Relocation costs (e.g. shipment of household goods).
	Use of car if needed in conjunction with research.	Travel to and from the center for the major professor.
	Salaries of aides and/or workers as agreed in connection with research.	
	Subsidized housing and food in accord with normal center practices for such personnel or as otherwise agreed upon with the U.S. Research Institution.	

For U.S. Research Institution Postdoctoral Fellows at the Centers

<u>U.S. Research Institution</u>	<u>International Center</u>	<u>USDA/CSRS AID Grants</u>
Overall planning and fiscal management by the U.S. research institutions	Management of the Research program	Salary and fringe benefits for fellow
	Use of land, buildings, facilities, labs, equipment, herds and flocks.	Travel to and from center for fellow and dependents.
	Expenses in connection with the research.	Relocation costs (e.g. shipment of household goods).
	Local transportation	Living expenses.
	Salaries of aides and/or others workers as agreed in connection with research.	
	Subsidized housing and food in accord with normal center practices for such personnel or as otherwise agreed upon with the U.S. Research Institution	

For U.S. Research Institution Visiting Scientists at the Centers

<u>U.S. Research Institution</u>	<u>International Center</u>	<u>USDA/CSRS AID Grants</u>
One-half salary and fringe benefits of scientists on sabbatic leave.	Overall scientific management of program.	One-half salary, fringe benefits for scientists on sabbatic leave and all salary and benefits for those not on sabbaticals.
Assurance of position on return from center.	Use of land, buildings, facilities, labs, equipment, herds and flocks.	Travel for one trip for the scientist to arrange program at the center.
Fiscal management of the program	Expenses in connection with the research.	Travel to and from center for scientist and dependents.
	Local transportation.	
	Salaries of aides and/or other workers as agreed in connection with research.	

U.S. Research Institution

International Center

USDA/CSRS AID Grants

Relocation costs
(e.g. excess
baggage allowance).

Living expense.

Model Projects and the Program Budget

Costs from one project to another will vary widely for a number of reasons. These include: (1) distance from the particular U.S. research institution to the specific Center with which linkages are developed; (2) a new program is more costly than if the activity were added to an ongoing program; (3) animal science research generally costs more than crop science research, and biological science research is considerably more costly than social science research--all measured on a per scientist year basis; (4) salary levels of visiting scientists and postdoctoral fellows vary considerably; and (5) variation in individual arrangements that are negotiated.

In addition, there will be wide variation among projects in terms of size, staffing and location of the research.

Model Projects: Project models were developed to illustrate the range and to use in preparing budget estimates.

Typical budgets for the grants portion of each model were developed on the basis of information provided by the Centers, Foundations, and U.S. research institutions that have current linkages with one or more Centers. The budgets were estimated on an annual basis, and projected to 1985 levels on the assumption that costs would be 10 percent higher in 1985 than in 1984.

The models involve inputs from U.S. research institutions, the Centers and AID as outlined in the previous subsection on Responsibilities. Only the AID grant costs are included in the following budget estimates. However, it should be noted that the U.S. Research Institution plus the collaborating IARC together will contribute at least twenty-five percent of the total cost of the research. The models are intended to illustrate the possible range and flexibility in size of projects, staffing and location. Actual projects will be as agreed upon by the Centers, the research institutions, the AID S&T/AGR project officer and the Research Grants Recommendation Committee and approved by the Director, S&T/AGR.

Project Model A

Research conducted at a U. S. research institution with 1/2 time graduate research assistant or 1/4 scientific aide.

Total grant cost \$10,000

Project Model B

Research conducted at a U.S. research institution with one graduate research assistant or 1/2 scientific aide.

Total grant cost \$20,000

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Project Model C

Research conducted at a U.S. research institution with 2 graduate research assistants and 1 scientific aide.

Total grant cost \$45,000

Project Model D

Research conducted at a center by a postdoctoral fellow or a visiting scientist on sabbatic leave.

Total grant cost \$50,000

Project Model E

Research conducted at a U.S. research institution with assistance of 2 graduate research assistants and 2 scientific aides.

Total grant cost \$65,000

Project Model F

Research conducted at a U.S. research institution with assistance of 2 graduate research assistants or 1 scientific aide and at a center with 1 graduate research assistant.

Total grant cost \$80,000

Project Model G

Research conducted at a U.S. research institution with assistance of 2 graduate research assistants and 1 scientific aide and at a center with assistance of 1 postdoctoral fellow and 1 graduate research assistant.

Total grant cost \$135,000

Budget for the First Two Years of the Program

In deciding on the magnitude of the program and its distribution among the various program elements, several factors were considered. One was the interest expressed by the Centers. Another was the absorptive capacity of the Centers--even the biggest have limited laboratory and housing space to accommodate visitors, and some Directors indicated they were limited to one to two visitors at a time. A third factor was the likely interest and response of U.S. institutions/individuals. Another factor was the ongoing programs and future desires of other donor countries. In addition, a modest initial program is contemplated with future expansion depending upon experience that will show whether the program is successful and subject to funds being available.

The magnitude of the program proposed, its distribution among the project models given above and budget estimates for the grants portion of the program for the first three years follow. The plan provides for spreading the administrative workload over a three year start-up period, with the program leveling off at the magnitude shown for the third year.

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BUDGET

Budgets for Years 1 and 2: \$1,200,000

<u>Project Model</u>	<u>Number of Projects</u>	<u>Cost per Project</u>	<u>Total AID-Funded Cost</u>
A	4	\$10,000	\$ 40,000
B	5	\$20,000	\$100,000
C	11	\$45,000	\$495,000
D	2	\$50,000	\$100,000
E	2	\$65,000	\$130,000
F	1	\$80,000	\$ 80,000
G	1	\$135,000	\$135,000
<u>Administrative Costs:1/</u>			<u>\$120,000</u>
Totals for Years 1&2 26			\$1,200,000

Third Year Budget: \$1,000,000

<u>Project Model</u>	<u>Number of Projects</u>	<u>AID Cost per Project</u>	<u>Total AID-Funded Cost</u>
A	10	\$10,000	\$100,000
B	10	\$20,000	\$200,000
C	10	\$45,000	\$450,000
D	3	\$50,000	\$150,000
<u>USDA/CSRS Research Contractor Unit Administrative Costs:1/</u>			<u>\$100,000</u>
Totals for Year 3: 33			\$1,000,000

Fourth Year Budget: \$1,000,000 - Same as 3rd year.

Fifth Year Budget: \$1,000,000 - Same as 3rd year.

1/ Administrative Cost at 0.10

Source of Funds

Funds for this project are included in the S&T/AGR OYB FY 1985 and the FY 1986 CP.

ANNEX E

ENVIRONMENTAL IMPACT

Initial Environmental Examination - the activities of this project fall into the area described in Environmental Procedure Regulations, Para. 216.2 (c) "Analyses, Studies, Academic or Investigative Research Workshops and Meetings". These classes of activities will not normally require the filing of an Environmental Impact Statement or the preparation of an Environmental Assessment. It is possible that an output of this project will be a set of procedures, guidelines or research results which when used would require such assessment. However, the project itself only proposes research and directly supportive activities. Under these guidelines this activity clearly qualifies for a negative determination at the time when a threshold decision is determined. Research grant projects on animal diseases will be required to observe international protocol for such research.

**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Life of Project:
From FY 85 to FY 89
Total U.S. Funding \$4,200,000
Date Prepared March 14, 1985

Project Title & Number: Cooperative Research on Special Constraints for IARCs Project No. 936-4136

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><u>Program or Sector Goal:</u> The broader objective to which this project contributes: <u>Program or Sector Goal:</u> To increase agricultural production and food availability in LDCs as a result of the research programs of the IARCs.</p>	<p><u>Measure of Goal Achievement:</u> Selected agricultural production and consumption figures in the LDCs. Human Nutrition and Health survey results for selected LDCs.</p> <p><u>Conditions that will indicate purpose has been achieved:</u> End of project status: Establishment of permanent working relationships to provide back-up research from the USRI's to the IARCs.</p>	<p>Published FAO host country data.</p> <ol style="list-style-type: none"> Annual reports of the USRI investigators and of the IARCs. CSRS/USDA records and reports. <p>USRI's scientists and IARCs scientists' reports of utilization of this project's research grant products in Center program.</p>	<p><u>Assumptions for achieving goal targets:</u> Sufficient interest in the IARCs to make effective use of the small grants.</p> <p>Small research activities will solve IARC research bottlenecks and lead to research breakthroughs important to IARCs' programs.</p>
<p><u>Project Purpose:</u> <u>Project Purpose:</u> To overcome specific obstacles to technological breakthroughs at the IARCs which the Centers lack the capacity to address alone.</p>	<p><u>Existence of a world-wide network of USRI's and IARCs to provide back-up research from the USRI's to centers global system.</u> Utilization of this project's small grant research findings in back-up to the core program research of the International Agricultural Research Centers (IARCs).</p>	<p>IARC's reports of enhanced ability to deliver improved technology to LDC research institutions.</p> <p>LDC research institution reports on the utilization of that technology.</p>	<p><u>Assumptions for achieving purpose:</u> The U.S. research scientists, techniques methodologies are adequate/available for meeting centers need on both a long-term and short-term basis.</p>
<p><u>Outputs:</u></p> <ol style="list-style-type: none"> Improved technologies that meet Center priorities. 15 scientists yearly successfully undertake back-up research. Relatively new knowledge is developed allowing centers to enlarge their programs. Cost effective techniques developed to conduct field verification of technologies and their transfer to LDCs. 	<p><u>Magnitude of Outputs:</u></p> <ol style="list-style-type: none"> Ten improved technologies and methodologies. Ten new or improved USRI's and IARCs back-up research links formed yearly. Joint publications between USRI and IARCs scientists. Some graduate degree theses. Centers deliver new technology faster or to more LDCs. 	<ol style="list-style-type: none"> On-site visits by S&T/AGR and USDA project officers. Annual reports from investigators. Copies of publications/trip reports. Copies of Memoranda of Agreement between USRI's and IARCs. 	<p><u>Assumptions for achieving outputs:</u> Adequate number of interested U.S. and IARCs' investigators.</p> <p>Adequate interest backed up by action on the part of both the USRI's and the IARCs for effective implementation.</p>
<p><u>Inputs:</u></p> <ol style="list-style-type: none"> AID provides project guidance and financial support. USDA/CSRS provides project management, including screening and selection of proposals. Several small research grants. 	<p><u>Implementation Target (Type and Quantity)</u></p> <ol style="list-style-type: none"> AID funding about \$4,200,000 for 5 years and provide project officer. USDA/CSRS - Program Manager (6.0) months and support services (9.0) months per year. Up to 30 research grants per year at a total cost of \$10,000 to \$50,000 each. 	<p>Programs in place operational and at appropriate funding levels with full involvement of USDA/CSRS and S&T/AGR program managers.</p>	<p><u>Assumptions for providing inputs:</u></p> <ol style="list-style-type: none"> AID/W makes funds available in a timely and adequate fashion and provides required technical oversight. USDA/CSRS provide program support and management is adequate to operate a worldwide multitalented scientific network to solve critical bottlenecks at IARCs. An average of 20 yearly are funded under this program.

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