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AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT PAPER FACESHEET				1. TRANSACTION CODE <input type="checkbox"/> A ADD <input checked="" type="checkbox"/> C CHANGE <input type="checkbox"/> D DELETE			PP 2. DOCUMENT CODE 3				
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5. PROJECT NUMBER (7 digits) <div style="border: 1px solid black; padding: 2px; display: inline-block;">931-0786</div>		6. BUREAU/OFFICE A. SYMBOL DSB		B. CODE <div style="border: 1px solid black; padding: 2px; display: inline-block;">180</div>		7. PROJECT TITLE (Maximum 40 characters) Improvement of Postharvest Grain Systems					
8. ESTIMATED FY OF PROJECT COMPLETION FY <div style="border: 1px solid black; padding: 2px; display: inline-block;">8</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">5</div>				9. ESTIMATED DATE OF OBLIGATION (for 5-year extension) A. INITIAL FY <div style="border: 1px solid black; padding: 2px; display: inline-block;">8</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">0</div> B. QUARTER <div style="border: 1px solid black; padding: 2px; display: inline-block;">4</div> C. FINAL FY <div style="border: 1px solid black; padding: 2px; display: inline-block;">8</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">5</div> (Enter 1, 2, 3, or 4)							
10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$1 -)											
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		877		877	5614		5614				
(GRANT)		(877)	()	(877)	(5614)	()	(5614)				
(LOAN)		()	()	()	()	()	()				
OTHER U.S.		1.		2.							
HOST COUNTRY											
OTHER DONOR(S)											
TOTALS		877		877	5614		5614				
11. PROPOSED BUDGET APPROPRIATED FUNDS (\$000)											
A. APPROPRIATION		B. PRIMARY PURPOSE CODE		PRIMARY TECH. CODE		e. Thru 9/30/79		h. 1st FY 80		k. 2nd FY 81	
				C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) ARDN		172		010I	-	4790	-	877	-	1061	-
(2)											
(3)											
(4)											
TOTALS				4790	-	877	-	1061	-		
A. APPROPRIATION		n. 3rd FY 82		q. 4th&5th 83&84		LIFE OF PROJECT		12. IN-DEPTH EVALUATION SCHEDULE <div style="border: 1px solid black; padding: 5px; display: inline-block;"> MM YY 09 82 </div>			
		O. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN				
(1) ARDN		1205	-	2471	-	10,404					
(2)											
(4)											
TOTALS		1205	-	2471	-	10,404					
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IMPROVEMENT OF POSTHARVEST GRAIN SYSTEMS

I. PROJECT SUMMARY AND RECOMMENDATION:

- A. Recipient and Implementing Agent: Food and Feed Grain Institute (FFGI) of Kansas State University
- B. Total Cost of Grant: \$5,614,000 (Five million six hundred fourteen thousand)
- C. Description of Project The grant money will be used to extend the existing "Improvement of Postharvest Grain Systems" project (931-0786) for five years. FFGI has been implementing the project since 1967. Project outputs include generation of basic and developmental research to reduce postharvest food losses; provision of information, consultants, and training to participating countries; cooperative research staff, student, and information exchange conducted with the University of Costa Rica; and, when requested, AID/W representation at GASGA (Group for Assistance on Systems relating to Grains After-harvest) meetings by FFGI staff. To date over 45 countries have used FFGI services. Over the next five years the project will refocus its activity toward the reduction of postharvest grain and legume losses of the small farmers.
- D. Purpose of Project: To improve the capability of small farmers, agribusiness, and government agencies in cooperating countries in the design and implementation of improved postharvest systems for cereal grains and pulses.
- E. Beneficiaries: Developing country small farmers, agribusiness, government agencies, and the staff and students of the University of Costa Rica participating in the collaborative research and training exchange with FFGI.

- F. Feasibility Findings: The project has been found to be economically, socially, technically, administratively, environmentally, and financially sound. FFGI has proven its managerial ability over the last 13 years and has performed with excellence. The infrastructure to achieve the project purpose is already established and functioning. The five year Cooperative Agreement with special emphasis on the postharvest problems of small farmers poses no implementation problem. FFGI is eager to assist AID in this project of technical assistance and is willing to refocus its efforts toward alleviating the postharvest grain and legume losses of the poor majority in the developing countries.
- G. Recommendation: Authorization of a grant for \$5,614,000 per the terms specified in this Cooperative Agreement.

II. BACKGROUND AND PROJECT DESCRIPTION

A. Background

The continuing goal of this project is to reduce postharvest cereal and legume grain losses in Cooperating Countries through improving postharvest systems for small farmers, industries, and government agencies. AID/W and the Food and Feed Grain Institute (also referred to as FFGI or the Recipient) propose, as a pathway, increasing the capability of agribusiness and government agencies to design and implement improved cereal and legume grain postharvest systems appropriate for small farmers.

A National Academy of Sciences' (NAS) study and the United Nations General Assembly have indicated the relative importance and magnitude of the problem postharvest grain losses represent to developing countries. The NAS study suggested that a 50 percent reduction from 1975 levels of postharvest food losses could significantly reduce, and potentially even eliminate the current need for some developing countries to import large quantities of food, particularly cereal and legume grains. The UN General Assembly has targeted 1985 as the date by which to achieve the goal of reducing postharvest food losses by 50 percent over the 1975 levels. Increasingly, as developing country governments recognize the importance of the problems and the benefits accruing from the achievement of the UN General Assembly's goal, AID is receiving more requests for help in addressing the problem. Recent estimates indicate that up to 80 percent of the food produced in some developing countries does not leave the farm (NAS). To effectively address the concern of cereal and legume grain losses, attention needs to be focused on the small farmer. This includes the complete postharvest system - harvesting, processing, storage, handling, and marketing.

It is equally important that investigation, development, and implementation of improved and technologically appropriate systems be analyzed in terms of the relevant social and cultural context of the proposed beneficiaries.

In addition to the small farmers/producers and their families, beneficiaries include rural inhabitants other than the producer and his/her family; related agribusiness and its employees; rural services centers; and ultimately, all other consumers.

B. Project Description

To achieve the project purpose -- improving the capability of agribusiness and government agencies in Cooperating Countries in the design and implementation of postharvest systems of cereal and legume grains, with an emphasis on grain losses of small farmers -- AID and the Recipient will be involved in two general areas of concentration: (1) improving the FFGI's institutional capacity to provide assistance in dealing with the problem; and (2) applying the FFGI's expertise through outreach activities.

1. Institutional Capacity

To improve their institutional capacity, FFGI will have three main activities: (a) the Recipient will initiate and continue basic and applied research concerned with improving cereal and legume grain postharvest systems, particularly those involving small farmers; (b) FFGI will continue to develop and collect information and training material related to postharvest systems, with an emphasis on small farmer systems; and (c) the Recipient will develop research, personnel, recommendations, and information exchange with a qualified institution in one Cooperating Country (Costa Rica).

a. Research FFGI will concentrate its research efforts on research appropriate for application to the postharvest grain loss problems of small farmers. Annual research plans for work supported by this Cooperative Agreement will be submitted to DS/AGR Project Officer for annual approval. Appropriate research topics may include topics such as:

- Harvesting technology as it affects the small farmer in terms of grain condition, length of harvest period, cost (equipment vs. labor) and constraints on handling, drying, and storage facilities;
- Storage, particularly cost-effective methods and technologies aimed at reducing losses of cereal and legume grains in humid and arid tropics at the small farmer level;
- Marketing, locality, and country specific methods and techniques that promote more efficient and effective marketing channels which benefit the small farmer;
- Agribusiness development, involving the identification, development, and implementation of systems for processing, storage, and distribution of grain and legume products that are culturally feasible, suitable, and encouraging to small agribusiness and small farmers;

b. Information and Training Materials The second activity to improve the institutional advisory capacity has three major components.

- Postharvest Documentation Service (PDS) will be operated and expanded to provide a computerized data base from which subject matter searches with computer printouts of title and/or abstracts can be extracted and provided when requested.
- Information and training materials including instructional, informational, and reference material will be developed and made available to AID, Cooperating Countries, and the Recipient for training, operations, and other activities. These instructional materials will be produced in English, French, and Spanish when requested and approved by the AID/W Project Officer.

Technical information response, utilizing the Postharvest Documentation Service to requests from AID, Missions, Cooperating Country Agencies, institutions, and individuals throughout the world.

c. Cooperation with the University of Costa Rica An agreement will be developed by FFGI for the exchange of research, information, and personnel with the University of Costa Rica. The program will include the following goals:

- Planning and conducting adaptive research on problems associated with tropical postharvest systems, including:
 - 1) Design and evaluation of grain dryers for developing countries in humid climates using indigenous construction materials, agricultural residues as fuel, and natural convection for air movement;
 - 2) Infestation reduction as it relates to postharvest storage losses, including the use of natural products and compounds to deter insects in stored cereal and legume grains;
 - 3) Evaluation and modification (when applicable) of traditional storage methods and facilities; development of culturally feasible, durable on-farm storage units from indigenous materials;
 - 4) Listing, evaluation, and recommendation or modification of emergency cereal and legume grain storage methods for use in developing countries;
 - 5) Assessment of various physical phenomena such as moisture migration patterns, environmental conditions on grain stored in various types of containers with emphasis on containers feasible for local use.
- Interchange of information and research data between FFGI and the University of Costa Rica.
- Reciprocal training of students from the the University of Costa Rica and the Recipient.
- Joint training of Cooperating Country participants by the University of Costa Rica and the FFGI.

2. Outreach Activities

The second area of concentration, the Recipient's outreach program, has three activities: (a) conducting training programs, (b) providing in-country technical assistance, and (c) representing AID in meetings of the Group for Assistance on Systems relating to Grain After-harvest (GASGA), when approved by AID/W Project Officer.

a. Training Programs The training programs include the following:

- In-country workshops and seminars of three days to three weeks duration developed and related to specific problem areas in the grain and legume postharvest systems of the particular Cooperating Country.
- The AID Postharvest Grain Handling and Marketing Short Course will be offered at KSU each summer for participants with moderate to extensive experience in grain handling, storage, or marketing. Extensionists responsible for relating appropriate postharvest practices designed to reduce and minimize losses at the small farmer level will be included in each short course presentation when possible. Topics to be included are: the fundamentals of grain storage, drying, grading, conditioning handling, sanitation, marketing, management policies, loss assessment methodology and design strategies for loss assessment surveys. The AID Postharvest Grain Short Course will address the problem of extension activities designed to reach small farmers in Cooperating Countries. The DS/AGR/AP Project Officer will approve the course outline and training materials annually.
- Academic programs (on the KSU campus) with any AID support from this Cooperative Agreement with the Food and Feed Grain Institute will focus on graduate training (particularly at the Master's degree level) and will be designed to reduce and minimize postharvest grain and legume losses in the developing countries. To help evaluate and determine the appropriateness of such programs supported by AID, plans for research and qualifications of any Graduate Assistants supported by this Cooperative Agreement will be submitted to the DS/AGR/AP Project Officer for review and approval. Special non-degree training programs may be arranged by special request and consent of both FFGI and the DS/AGR/AP Project Officer.
- Special programs which may include: (a) Recipient staff members participation when approved by the DS/AGR/AP Project Officer in nationally or internationally sponsored training programs, workshops, seminars, etc. when such participation is in the best interest of AID, Cooperating Countries and the FFGI; and (b) the Recipient meeting with groups or organizations representing grain storage, processing and/or marketing entities to discuss and solve problems related to postharvest systems, or identify new areas for research or technical assistance; and (c) special programs for extension agents who work with producers or small farmers.

b. In-country Technical Assistance The Recipient will undertake three activities under this program:

- Short-term assistance: Specialist teams will be assigned to focus on specific postharvest problems for a brief (maximum of 30 calendar day per mission per year) period of time upon requests approved by AID/W. Assistance may be in the form of: (1) development of feasibility and pre-feasibility studies;

(3) specific recommendations on postharvest grain and legume storage, handling, processing, and marketing problems, especially for small farmers; (4) agribusiness projects designed to assist the small producers; and (5) evaluation of economic and technical studies and proposals.

Long-term assistance: An agricultural engineer will be assigned to the Southeast Asia Cooperative Postharvest Research and Development Programme team which is associated with the Southeast Asian Regional Centre for Graduate Study and Research (SEARCA) in fiscal years 81, 82, and 83.

Impact evaluations: FFGI consultants will assist in the design and implementation of appropriate follow-up impact evaluations of previously supplied assistance when approved by DS/AGR/AP Project Officer in consultation with appropriate agricultural staff of AID Bureaus, or Missions.

c. GASGA Representation A representative of the Recipient staff will attend GASGA activities when approved by DS/AGR/AP Project Officer.

III. SPECIFIC ANALYSES

A. Economic Analysis

The purpose of this Cooperative Agreement is to provide technical assistance and advisory services to AID missions and Cooperating Country governments upon request. The assistance is intended to help in reducing postharvest cereal and legume grain losses in Cooperating Countries. Because of the indefinite quantity of services to be rendered under the terms of this Agreement as well as the necessary vagueness about sites for postharvest food loss (PFL) projects under this Agreement, it is difficult to assess costs and benefits of a specific PFL project. The economic feasibility of each proposed PFL project must be made on a site by site basis taking into account the specific alteration being proposed, the economic, technical and social soundness of institutions in each specific area, as well as other location-specific and cultural factors.

These site specific analyses will be conducted by the Recipient as part of the in-country technical assistance and advice. The effectiveness of this type of technical assistance Agreement can be analyzed and quantified in retrospect by identifying the aggregate benefits in all Cooperating Countries and assessing the contribution of the planning and implementation of PFL project designs. Also the country inputs can be quantified and compared to the amount of stored products saved following implementation of FFGI recommendations for PFL projects. Loss assessments and country or regional loss surveys may be requested to help identify where inputs are most critically needed in the postharvest systems of Cooperating Countries.

The analysis will assess the viability of PFL projects only in general terms. The evaluation of PFL projects will consider two major questions: "What is the effectiveness of the recommended PFL project compared to alternative means to achieve the goal?" and "What is the economic justification of this particular project?" In designing the evaluation of PFL projects, the Recipient must also consider how costs and benefits to the local populations are to be measured and what components will be included in site-specific analyses.

1. Alternatives for Achieving Goals

The goal of this project is to increase the quality and quantity of cereal and legume grains available to consumers in Cooperating Countries. This is the explicit or implicit goal of most food production projects. Historically, the most common approach to achieving this goal has been to increase production of foodstuffs within the country. Another alternative for achieving this goal is in the promotion and expansion of food import programs to supplement local production and satisfy nutritional requirements of the population. An indirect approach would be to reduce the number of consumers, thereby increasing the amount of food available on a per capita basis--population control programs would fall into this category.

Clearly the latter two programs are less desirable alternatives. Increasing imports is at best a short term solution which exacerbates the already severe foreign exchange and debt repayment problems in many developing countries without addressing the basic problems underlying food shortages. Conversely, population control is a very slow process which offers little relief to the immediate problems. While increased food production is an integral part of any long term solution, it is only one part of the total system of food production, distribution, and consumption. As in many systems, strengths in one part will not offset weaknesses in another. This is particularly true with the problems of postharvest losses. Estimates of postharvest losses range from 10-50%. In countries with high postharvest losses, production oriented programs are significantly less effective than they might be. Therefore, logic dictates that to make more effective use of development monies and projects addressing other aspects of the food system, high priority should be placed on reducing and preventing postharvest food losses.

2. Justification of Postharvest Grain Loss Reduction

This Agreement is intended to provide technical assistance on postharvest systems for cereal and legume grains to institutions in developing countries. With this purpose, the direct benefits of the project are both tangible and intangible and relate to the increased capability of host country officials, small farmers, and AID Mission personnel to plan these types of interventions.

Whether the benefits are intangible or not, the services are necessary for successful reduction of postharvest losses in developing countries. At the origin of this project, it was determined that the most

cost effective means of providing these services would be to establish a reservoir of expertise which could be tapped by AID missions and Cooperating Countries whenever necessary. This expertise was to be applied through training programs, short courses, and consultant services. The current project (as a Cooperative Agreement) will continue the original project objective, build and strengthen the reservoir of expertise of FFGI in providing increased support to small farmer situations in developing countries.

The indirect benefits of the project include the results of PFL projects initiated through the technical assistance. Although these benefits depend entirely on how the Cooperating Country governments choose to utilize the information, the benefits of improved project design can be attributed to the technical assistance.

The Recipient, as part of each PFL project proposal or recommendation for interventions in a Cooperating Country project will include a specific analyses of the cultural and economic feasibility of the project. An understanding of the relevant costs and benefits of this type of project is helpful in appreciating the worth of the proposed interventions. Therefore, a brief summary of the benefits and costs common to PFL projects which will result from the Recipient advisory services is presented below:

Postharvest losses can occur in any of the many harvesting, storage, marketing, and processing functions which are performed before the product finally reaches the ultimate consumer. These losses may take the form of physical, qualitative, or nutritional losses through harvesting, drying, spillage, contamination, pest damage, or deterioration in storage. A particular postharvest system utilizing the services of the Recipient might focus on any or all of the many steps of the process in which problems or losses are identified.

Within any one country, the benefits and costs of a particular project would be quite specific. The costs of a system would include the direct costs, such as personnel costs, purchase of materials, commodities and the indirect costs. Negative spillovers of the PFL projects might include losses by merchants involved in traditional marketing and processing systems being replaced by different technologies, and additional expenses incurred by farmers and merchants due to changes in the traditional systems.

The economic benefits of a well designed project fall in three major areas. The first area involves the quality and quantity of crucial foodstuffs on small and traditional farms. The calories and proteins of cereal and legume grains are an important source of nutrition for most poor families in the world. This fact, in conjunction with the estimate that 80% of the food grown in the developing countries remains on the farm justifies the emphasis of the project on "small farm systems". A reduction in postharvest losses can mean an immediate increase in available food supplies for the farm family. This increased supply might either reduce or eliminate the need for the family to purchase additional

food during the year, or it might be used to sell as surplus on the market -- either way being an obvious quantifiable family benefit. An additional benefit of reducing postharvest grain and legume losses would be an improved nutritional value of the stored grain, and as a result the labor productivity of a healthy family may be increased.

A second area of benefit from reducing postharvest losses results from an increased potential of small farmers to enter the market as less grain is lost to insects, rodents, etc. Increasing the quality and quantity of safely stored grain would help to increase the farmer's income. The effect of physically and visually being able to recognize fewer losses would help to promulgate the innovations or technologies designed to reduce losses to neighboring farmers. These effects would be contingent upon market conditions and structure as well as government food policies.

In the third area, consumers both rural and urban would benefit through increased supplies and quality of cereal and legume grains, and a possible lowering of processed grain product prices. Some of the introduced innovations would spawn agribusiness enterprises (such as grain bin fabricators, suppliers of pesticides, or fumigation specialists) and tend to create rural employment, as well as increased income for existing middlemen/women by reducing their spoilage and increasing the market volume. The increased quality of grain and legume products may also be reflected in higher prices.

In summary, these direct intangible benefits appear in the form of increased capability by host country officials and institutions to design and implement improved postharvest systems and they are not now quantifiable. The potential benefits are sufficient, however, to justify this project on economic grounds.

B. Social Soundness Analysis

Physical, social, cultural, economic, institutional, and political conditions vary greatly among Cooperating Countries. It is therefore essential that the technical assistance and training provided to Cooperating Countries accurately reflects the desires and resources of those countries and their rural farmers. This calls for a case by case evaluation of the appropriateness of this assistance and training.

A crucial component of the evaluation is the social soundness analysis. This addresses concerns such as:

- (a) The acceptability of a proposed system or project within a particular social structure--do the people want it and to what degree will the current structure of society be altered?
- (b) Who will benefit and who will be hurt?
- (c) What foreseeable obstacles will hinder the implementation of the project?

(d) Through what avenue will the innovations be channeled?

(e) And to what extent will the adoption of a particular system or PFL project component by the initial target group lead to increased awareness and change among others in similar situations?

Economic and social analyses will be integrated in evaluating PFL project appropriateness. Social gains are often quantified in economic terms. To the extent possible, postharvest systems being introduced should expand on existing technologies and social structures. Local labor sources, raw materials, and technical skills should be used in providing needed components of these systems. Since a major portion of cereal and legume grains produced in developing countries are stored and consumed on the farm, technologies and postharvest systems should focus on the poor majority in the rural areas (small farmers who are not active in the market economy, and village level merchants or dealers). ANNEX B presents an outline for providing to AID and the Cooperating Country results of the social soundness analysis. The Recipient is responsible for providing to AID the results of a social soundness analysis in conjunction with technical responses to Mission requests when requested by AID/W.

C. Technical Analysis

1. Introduction

Traditionally, governments have attempted solution of the world food shortage dilemma by emphasizing (A) slowed population growth, and (B) expanded food production. The problem of postharvest food loss has not been adequately addressed. Losses are manifested in three ways: (1) physical loss of food; (2) reduction in quality resulting often in lower commercial value; and (3) loss in nutritive value. Increased food production strains existing postharvest systems, resulting in increased losses to these overloaded systems.

Cereal and legume grains are generally considered the most important part of the diet in developing countries. A summary of calorie and protein sources in developing countries indicates that over 1.5 billion people get more than half of their calories and protein from cereals. Grain legumes also play a critical role in global nutrition with production estimated at 50 million tons (FAO, 1977). Half of these cereal and legume grains are produced in developing countries. Grain legumes supplement cereal diets with essential amino acids which improve nutrition, where meat is scarce.

The purpose of this project is to improve the capability of agribusiness and government institutions in Cooperating Countries in the design and implementation of improved postharvest systems of cereal and legumes, with an emphasis on grain losses of small farmers. This purpose can be achieved and meets an existing demand in the developing world. For clarity of discussion, the technical justification is divided into the following three parts: 2. FFGI Suitability; 3. Cooperating Countries; and 4. Spread Effects.

2. FFGI Suitability

The Food and Feed Grain Institute of Kansas State University was established in 1966. Since its inception, FFGI has amassed a great deal of experience in providing technical information and problem solving services to Cooperating Countries. The staff consists of 30 people with varied technical backgrounds enabling the Food and Feed Grain Institute to provide the technical backstop services requested by developing nations for postharvest grain loss reduction. In addition, KSU personnel are available for professional consultation with FFGI staff and frequently travel to Cooperating Countries under other AID contracts. Research, information retrieval, training, and publication services are established and functioning in support of the current contract obligations. Foreign language translation specialists and persons experienced in training extensionists are readily available to FFGI and the needs of AID missions as a result of the services provided in this Agreement. Over the past 13 years, FFGI has become a comprehensive U.S. source of expertise capable of servicing the diverse needs of the developing countries. The FFGI has developed an excellent reputation with Missions and developing countries. This credibility with the developing countries will assist the implementation of the continuing Project. FFGI's ability to meet the specific project outputs is discussed below.

a. Research - Areas of developmental and applied research planned by FFGI cover aspects of grain harvesting, storage, processing, marketing, and agribusiness development. Recent and ongoing research involves grain drying for small farmers, appropriate techniques to control weevil infestation of grain, insect and mold susceptibility of millet varieties, and alternative cost effective postharvest handling systems for rice. Planned research areas include design for loss assessment surveys, natural products for insect control in stored grain, improved storage structures made from locally available materials, and a methodology for determining cost/benefit ratios of innovations in postharvest systems.

b. Information - A Postharvest Documentation Service (PDS) collects relevant reports, references, and documents on all phases of postharvest storage, processing, and marketing of grains from periodicals, world literature, and individual authors and scientists. Documents (microfiche or paper copies) are available free to requestors from AID countries or for a fee to developed countries requesting information. Subject searches of titles and abstracts are available as well as a monthly or annual acquisition list. The PDS collects documents at the rate of approximately 1,000 per year. Over 150 requests for documents are processed each year and over 50 countries have asked for the services of PDS. A Postharvest Grain Newsletter is planned in addition to the ongoing service. Technical information requests from scientists in developing countries are answered by the FFGI staff. In 1978-1979 there were 104 requests for technical information to which the FFGI staff responded.

c. Training - Training materials are updated on a regular basis, and new manuals, tape/slide units, and other forms of information are

produced as necessary. A series of cassette-tape slide lectures, in English, Spanish, and French are planned for two subject areas per year during the proposed project period. Over the past 13 years, FFGI has trained 491 participants in-country and 234 participants at the Recipient's site in Manhattan, Kansas. The on-campus AID Postharvest Grain Handling and Marketing Short Course planned for 1981-82 includes seven weeks of training at the Food and Feed Grain Institute. A minimum of ten in-country seminars and/or training workshops are planned (two minimum per year) for the proposed project period.

d. Technical Consultants - The FFGI staff are experienced in developing country problems and represent a broad spectrum of professional disciplines including: agricultural engineering, storage entomology, agricultural economy, library science, mycology, etc. When needed, consultants can be contracted by FFGI to satisfy additional Mission requests. FFGI is developing an international listing of postharvest grain and legume specialists in addition to a list of consultants available to the FFGI for technical consulting services under this Agreement. Types of assistance available to Cooperating Countries include (but are not limited to):

- development of pre-feasibility studies
 - specific recommendations on harvesting, storage, processing, marketing, and agribusiness development; and
- post-project evaluation of economic and engineering studies and proposals.

e. GASGA Representation - The Recipient will continue to act as AID's representative at meetings of the Group for Assistance on Systems relating to Grains After-harvest (GASGA), when requested. The Recipient will designate a staff member to act as the GASGA correspondent for AID when requested. The Recipient, on approval from the AID/W Project Officer, will represent AID at annual GASGA meetings, technical seminars and other GASGA activities. It is expected that the AID/W Project Officer will attend GASGA activities such as the annual meeting, depending upon the availability of funds, and may be accompanied by one staff member of the FFGI familiar with GASGA. Close communication will be maintained between the GASGA correspondent from FFGI and the AID/W Project Officer relating to GASGA activities. Materials printed or published relating to GASGA activities shall indicate the Recipient's representation of AID.

f. Cooperative Research - During 1980-81 FFGI will confer with the University of Costa Rica to plan research programs on postharvest problems under tropical conditions and to develop an agreement for cooperative research, reciprocal training, joint training, and exchange of personnel. The AID/W Project Officer will approve annual research plans, selection of trainees, and personnel including FFGI staff travel in relation to funds expended by the Recipient in support of this effort.

3. Cooperating Countries

Over the past 13 years, 45 developing countries have requested and received services from the FFGI. Increasingly, these countries are recognizing the economic losses experienced by small farmers, governments, and industries due to spillage and spoilage during harvesting, storage, processing, and marketing of grains. Technologies and training materials are available to encourage grain handlers to improve postharvest grain systems. Countries involved with FFGI have welcomed the availability of technical expertise for planning, designing, and implementing their programs. The technologies recommended by FFGI will continue to be evaluated for soundness and appropriateness to the countries involved. Cooperating Countries have been effectively utilizing the information, consultants, and training provided through the project to address their problems.

4. Spread Effects

Assistance provided by FFGI can be viewed as the "seed" for improvement of postharvest grain and legume systems in the participating developing countries. Information and technology provided to small farmers, private entrepreneurs, technicians, and managers becomes incorporated into new and existing postharvest systems. These serve as models for replication, provided they demonstrate perceivable improvements over previous systems. In this manner the technology can be spread throughout the Cooperating Countries. Once subsistence farmers and commercial producers adopt "grain saving" practices, more food will be available to the consumer and the quality of his nutrition may be increased accordingly. Should grain surpluses occur due to more efficient systems (estimates of grain losses range from 10-50% of the total production in developing countries) export markets can become stronger and provide employment for a larger segment of the population.

D. Administrative Analysis

The Food and Feed Grain Institute at Kansas State University has been receiving AID funding for this postharvest loss project since 1967. The personnel and procedures required for administering the Cooperative Agreement are established and have functioned satisfactorily since the beginning of the project. There is no reason to question the continued competence of the Institute administrators.

KSU is a solid educational foundation and will provide AID with a professional staff who have worldwide experience and the competence to assist in reducing postharvest grain and legume losses in developing countries. The staff has established a library and a retrieval system on grain storage, handling, processing, and marketing based on a bibliography produced by the National Academy of Sciences under contract from DS/AGR.

Mission and Cooperating Country requests for assistance will continue to be channeled through the regional bureaus and DS/AGR to FFGI.

The scope of work for requests for technical assistance or training assistance from Missions will be prepared by FFGI. The consultant team will be selected by FFGI with the scope of work and team selection subject to approval of the AID/W Project Officer. Briefing and debriefing in AID/W will be arranged by the regional bureaus and DS/AGR, if desired. Consultants not on the FFGI staff require AID Contract Office approval and non-citizens hired as staff require AA/DS approval. All travel is approved by DS/AGR with copies of itineraries sent to AID contract regional bureaus and concerned Missions for Mission and country clearances. No consultants will be reimbursed for services unless their use has prior written approval of the AID/DS/AGR Project Officer.

E. Project Officer's Role

The role of the AID/W Project Officer will be to monitor and approve administrative decisions within the Project (Cooperative Agreement). The DS/AGR Project Officer will have the final decision and approval for consultants hired by the Recipient, training seminars, workshops, research plans, technical short courses, and the selection of participants for these activities. The DS/AGR Project Officer will have final approval for graduate assistants funded under this Agreement who have been selected by KSU to work with Recipient staff. FFGI staff members funded partially or totally under the Agreement who wish to participate in training programs, workshops, seminars, etc., sponsored by various national or international organizations will seek approval from the DS/AGR Project Officer. The Project Officer will coordinate Project (Cooperative Agreement) evaluations. The DS/AGR Project Officer will represent AID at GASGA when possible and may delegate AID representation to GASGA to the Recipient when appropriate. The DS/AGR Project Officer will approve Cooperative Agreement funds expended by the Recipient in relation to the Cooperating Country Agreement to be signed by FFGI and the University of Costa Rica.

F. Environmental Analysis

Because this project is restricted to technical assistance and training, it will have no direct effects on air, water, land, flora, or fauna. Therefore, this activity is not deemed a major Federal Action (Section 1500.6, CEO Guidelines). It is recommended that the Threshold Decision be deemed negative, constituting a negative determination. The FFGI will ensure that all such pesticide use recommendations are reviewed under and comply with the provisions of para 216.3 (b) of AID's Environmental Procedures, Rule 16, as amended, and that appropriate pesticide residue tolerance levels have either been established by the USEPA or recommended by the Joint FAO/WHO Meeting on Pesticide Residues. The DS/AGR Project Officer will facilitate close communication with FFGI Mission responses and any resulting pesticide recommendations and the DS/AGR Pest Management and Related Environmental Protection Project. Within three months of signing of this Cooperative Agreement the DS/AGR Project Officer will review with FFGI all past Mission responses funded by this Project which relate to pesticide recommendations to determine if such recommendations have been in compliance with AID's Environmental Procedures. FFGI may subcontract pesticide residue analysis if deemed necessary and if approved by the DS/AGR Project Officer.

IV. FINANCIAL PLAN

A total of \$5,614,000 will be granted to the Recipient, disbursed over the next five years. The first disbursement is for fiscal year 1981. Annex C shows a breakdown of person-months requirements for both professional and non-professionals by activity and year. Annex D is an estimate of the approximate levels of funding by project activity. The estimates are based on the person-months requirements of the activities. The actual formula used is

$$\frac{\text{activity person-months}}{\text{total person-months}} \times \text{Yearly Budget.}$$

Annex E shows the project funding by year, donor and item. KSU and FFGI will provide part time consultants from their faculty, use of equipment, offices, resources, and fringe benefits, as well as covering indirect costs.

Since the initial funding in 1967, the FFGI has managed the project's financial matters according to sound and approved policy and practices. Such financial management of a program from the research stages through supplying technical assistance can be measured in two ways: through the success of its endeavors and the increasing numbers of requests for assistance. This Agreement will assure the continuation of FFGI activities in the area of postharvest grain loss reduction in developing countries. Annual reports should include costs and expenditure justification.

This project has changed slightly in this proposal to include a greater emphasis on technologies appropriate to small farm systems. It is financially more sound to redirect the focus of an existing institution to the appropriate needs than to develop a completely new research center. As mentioned previously, the Recipient has the technical capabilities, the managerial competence, and the experience to carry out the necessary new directions of the project.

V. IMPLEMENTATION

Implementation of this project depends on several parties, primarily the AID/W Project Officer and the FFGI. Secondly, the project depends upon the Cooperating Countries' governments and the USAID Missions to request the assistance FFGI is to provide under the terms of the Agreement. Both the AID/W Project Officer and the FFGI are responsible for negotiating and signing the Cooperative Agreement. Correct and timely submission of the PIO/T is the responsibility of the AID/W Project Officer. The AID/W Project Officer is also responsible for seeing that the authorized and allocated Cooperative Agreement funds are dispursed to the Recipient in a timely and orderly manner.

FFGI, the Recipient, shall apply the funds according to the negotiated budget. Project activities shall be carried out as stipulated in the Agreement by the Recipient to the satisfaction of the AID/W Project Officer. As this is a continuing project, activities currently in progress shall continue on a reasonable, as determined by the Recipient and AID/W Project Officer, timetable. New activities, such as new research, shall be approved by the AID/W Project Officer. Initiation of new research shall occur when appropriate in terms of budget, academic schedules, personnel availability, and agreement by the AID/W Project Officer and, when appropriate, the Cooperating Institution. Implementation of other activities related to the Documentation Center, training, technical assistance, and GASGA representation are the responsibility of the Recipient with concurrence of the AID/W Project Officer. Activities related to joint work with a Cooperating Institution will proceed according to joint decisions of the Recipient and the Cooperating Institution, with the approval of the AID/W Project Officer.

Responsibility for the monitoring of this project is on the AID/W Project Officer. Summary reports, the FFGI annual reports, the consultants reports on their activities and recommendations, theses and research publications, and appropriate USAID Mission reports may be used by the AID/W Project Officer in determining the efficacy of the Recipients efforts. The same reports can be used to determine if the Recipient is fulfilling the terms and spirit of the Cooperative Agreement.

Based upon the FFGI'S annual reports, field reports and other appropriate sources, the AID/W Project Officer shall evaluate the Recipient's past efforts to determine if they adequately satisfy the Congressional mandate to focus on the poor majority. If, it is determined that some degree of improvement is required, the Recipient and the AID/W Project Officer will determine what needs to be done to more closely satisfy the mandate.

VI. OVERALL PROJECT EVALUATION

The Recipient, by means of summary reports, contributes much to the project evaluation. These short reports are submitted to the AID/W Project Officer in a timely manner after each approved activity. The Project Officer may request an additional report from AID missions if an independent verification is deemed advisable.

The AID/W Project Officer will request a summary of the Recipient's contribution from a sample of USAID missions once a year. These reports, together with the Recipient's annual report, will constitute the yearly formative evaluation of the project. The Project Officer, through the approval mechanism, and the Recipient staff shall be responsible for routine formative and summative evaluations of activities. During the fifth year, the Recipient executive officer will assemble and submit a long-term report of the progress of the project. (This report, written in lay terms, will be very concise; illustration and summary tables are preferred to profuse explanation.) This overall report represents a summative evaluation of the project. Among its uses may be: justification of project expenditure before Congress, basis for future cooperative agreements, and illustration to the general public of AID and Recipient accomplishment. The AID/W Project Officer will approve the draft of this report before orders for reproduction are made.

During the second quarter (April-June) of the second year of the Cooperative Agreement (1982) the AID/W Project Officer will arrange for a comprehensive one week evaluation of the project with the Food and Feed Grain Institute. DS/AGR will fund the evaluation, depending upon the availability of funds, and the FFGI will cooperate with DS/AGR in preparing the necessary reports, financial accounts, and research summaries requested by DS/AGR for distribution to the evaluation team (to be selected by DS/AGR) prior to the evaluation. Results of this comprehensive evaluation will be used to determine:

- A. The effectiveness of the FFGI in responding to the postharvest grain and legume loss problems of small farmers in developing countries;
- B. The overall success of various project components;
- C. The effectiveness of the on-campus short course versus in-country training;
- D. Which adaptive research projects have had the greatest impact;
- E. Other criteria to be determined by DS/AGR prior to the evaluation.

The evaluation will review the period from 1967 to 1982 and shall compare the effectiveness of the project under the contract AID/ta-C-1162 with the changes resulting from the implementation of this Cooperative Agreement.

**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Lif/ of Project: \$10,404,000
 From FY 80 to FY 81
 Total U.S. Funding \$5,614,000
 Date Prepared: 8/15/80

ANNEX A

Project Title & Number: Improvement of Postharvest Grain Systems 931-0786

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes: To reduce losses of cereal and legume grains through improved postharvest systems for small farmers, industries, and government agencies.</p>	<p>Measures of Goal Achievement: 1) Quality of target crops remains stable after harvest. 2) Quality of marketed target crops in the cooperating country shows less spoilage, water, rodent, insect, and handling damage.</p>	<p>1) Recipient/host country conduct analysis for comparison to baseline data. 2) Same as 1.</p>	<p>Assumptions for achieving goal targets: Cooperating countries make local grain available to consumers at levels sufficient to meet nutritional requirements.</p>
<p>Project Purpose: To improve the capability of farmers, agribusiness, and government agencies in cooperating countries in the design and implementation of postharvest systems for cereal grains and pulses.</p>	<p>Conditions that will indicate purpose has been achieved: End of project status. 1) Target crops show decreased physical and biological loss. 2) Selected postharvest systems show increased efficiency.</p>	<p>1) Recipient and host country analyze crop statistics to verify decrease from baseline data. Amount of decrease to be negotiated by IIC/USAID/Recipient. 2. Recipient/IIC analyze agribusiness and marketing statistics to verify an increase from baseline data. Amount of increase to be negotiated by IIC/USAID/Recipient.</p>	<p>Assumptions for achieving purpose: Financing is available to upgrade postharvest systems. Host country values a reduction in postharvest losses. Technical systems supplies by Recipient are effectively utilized. Farmers and merchants accept systems provided by Recipient.</p>
	<p>3) Improved postharvest systems continue to operate.</p>	<p>3) Personnel, equipment, facilities and training are available in-country to prolong project functions.</p>	<p>Continuing political stability occurs in the host country.</p>
<p>Outputs: 1) Basic and applied research for improving postharvest systems of small farmers in cooperating countries initiated and continued.</p>	<p>Magnitude of outputs: 1.a) Analytical instruments exist for measuring harvest technology, storage, processing, marketing, and agribusiness development. b) Plans are filed by Recipients prior to beginning research; work is summarized at appropriate intervals.</p>	<p>1.a) A summary of development method, validity and reliability testing is available. b) A completed work plan is on file at Recipient's office, including study goals, methods, duration and cost estimates.</p>	<p>Assumptions for Providing Outputs: Missions and cooperating countries continue to request technical assistance. Qualified participants are available for training.</p>

**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Life of Project: \$10,404,000
From FY 80 to FY 81
Total U.S. Funding \$5,614,000
Date Prepared: 8/15/80

Project Title & Number: Improvement of Postharvest Grain Systems, 931-0786

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Outputs:</p> <p>2. Information and training materials on postharvest systems collected and disseminated to USAIDs, cooperating counties and the Postharvest Documentation Service.</p>	<p>Magnitude of Outputs:</p> <p>c) Research is brought to the attention of scientific and development community.</p> <p>2.a) Appropriate technological publications are available to users.</p>	<p>c) A list of published papers and a summary of unpublished work is included in the annual report.</p> <p>2.a) Records are kept by recipient on the number, type, and size of requests, and the project which will use the information.</p>	<p>Assumptions for achieving outputs:</p> <p>USAIDs will fund participant training.</p> <p>An appropriate institution can be found to cooperate.</p>
<p>3. Training in appropriate postharvest systems adapted and conducted in-country and in academic and short courses.</p>	<p>b) Follow-up inquiries are made on selected requests to determine the efficacy of the provided materials.</p> <p>3.a) On-campus training of participants is available, conducted, and evaluated.</p>	<p>b) A summary of follow-up results is included in the annual report.</p> <p>3.a) Summary of training courses, including curricula, country, target positions of students, and student evaluation appears in Recipient's annual report. Instructor's evaluation includes initial student abilities and expected benefits from training.</p>	
	<p>b) Follow-up inquiries are made to students whose training lasted 7 days or more.</p> <p>c) Goals, format, and materials exist for in-country workshops. Appropriate presentation methods have been devised.</p>	<p>b) A year after completion, Recipient will ascertain that participants obtained target position and are using skills from the training.</p> <p>c) Explicit goals and a summary of format, materials are available in DS/AGR.</p>	
<p>4. Technical consultants provided to USAIDs and cooperating countries for long and short team work.</p>	<p>d) Workshops are evaluated.</p> <p>4.a) Consultant services provided at request of missions and countries.</p>	<p>d) Summary of workshops, including country, target positions of students, level of training on entry to workshop, cost, duration, and direct and indirect benefits, is included in the Recipient's annual report.</p> <p>4.a) Recipient keeps records of requests, including staff, duration, cost, goals of consultation.</p>	

Project Title & Number: Improvement of Postharvest Grain Systems 931-0786

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Outputs:</p> <p>5. AID/W represented to GASGA.</p>	<p>Magnitude of Outputs</p> <p>b) Consultation evaluated by USAID/HC/Recipient.</p> <p>5.a) Recipient consults with DS/AGR prior to GASGA meetings.</p> <p>b) Recipient attends GASGA meetings when approved by Project Officer</p> <p>c) GASGA attendance evaluated.</p> <p>6.a) Agreements exchanged between institutions.</p>	<p>b) Summary of consultation, including goals, principal activities, social and economic effects of the project, design advantages and disadvantages, cost and duration, appears in Recipient's annual report.</p> <p>5.a) Memoranda of consultations/instructions are on file at DS/AGR and with Recipient</p> <p>b) GASGA proceedings and papers presented by Recipient are available to DS/AGR.</p> <p>c) Recipient prepares a summary of GASGA long and short term goals and progress made since last meeting.</p> <p>6.s) Summary of agreement included in annual report, with names, curricula, goals, costs, duration, benefits of exchange.</p> <p>b) See lb) and lc) above.</p> <p>c) List of published papers and summary of unpublished work appears in Recipient's annual report.</p>	<p>Assumptions for achieving goal targets:</p>
<p>6. Cooperative research staff, student, and information exchange conducted with an appropriate institution.</p>	<p>b) Cooperative research is carried out.</p> <p>c) Research activities made available to scientific and development community.</p> <p>d) Personnel (including students).</p>	<p>Implementation Target (Type and Quantity)</p> <p>A.I.D.</p> <ol style="list-style-type: none"> 1. \$2,494,791 2. 383,248 3. 1,383,159 4. 142,800 5. 499,520 6. 252,237 7. 254,600 8. 98,348 9. 105,000 <p>\$ 5,613,703</p>	<p>Assumptions for providing inputs:</p> <p>A.I.D. Funds Available</p>
<p>Inputs:</p> <p>A.I.D. Grant to F.F.G.I.</p> <ol style="list-style-type: none"> 1. Salaries 2. Fringe Benefits 3. Indirect Costs 4. Consultants 5. Transportation 6. Allowances 7. Other Direct Costs 8. Equipment 9. S.E.A.R.C.A. 	<p>F.F.G.I. Contribution</p> <ol style="list-style-type: none"> 1. \$ 416,347 2. 69,738 3. 239,640 4. 125,000 5. 175,546 <p>\$1,044,471 TOTAL</p> <p>Professional 1,260 Nonprofessional 240</p>	<p>A.I.D. & F.F.G.I. Records</p>	<p>Person Hours</p>

ANNEX B

SOCIAL SOUNDNESS

There are 3 major components to a social soundness analysis:

- (1) social cultural compatibility;
- (2) spread effect of the innovation, system, or training;
- (3) social impact-degree of equity resulting.

In addressing how appropriate a project is within a social cultural setting, several questions should be considered.

- Who are the projects beneficiaries or targeted group?
- Who may suffer from the projects implementation?
- Who may pay for the project, either directly or indirectly?
- Is the project appropriate within the context of the affected people's lives?
- Will the peoples roles be altered; are there minimum qualifications such as training, financial means, attitudes or beliefs for involvement in the project; are there levels of qualification which would exclude involvement in the project?
- Who would oppose the project and for what reasons?
- What would motivate people to seek assistance or involvement in the project?
- How will the information or assistance be made readily available?

The spread effect of the assistance should be evaluated in terms of the extent it is likely to occur to related sectors beyond the initial target group and what additional inputs are necessary to encourage or speed up the spread of a particular innovation or system.

- How will the spread effect occur (through what avenues will others learn of the innovation)?
- What will assure continued use of the system or innovation?
- To what extent can the existing social structure (community leaders, family structure) be used in encouraging project acceptance?

- What is a realistic time frame for having significant impact on the achievement of the project goal through dissemination of the system or innovation?

The degree of equity from a given projects' implementation is a key concern for measuring development progress.

- How will the project affect income redistribution, employment opportunities, and social strata?
- Will changes in authority and responsibility negatively influence other aspects of the social structure?
- Will the poor benefit directly?
- What is the nature of the effect on the poor (increased income from traditional occupations, changes in occupational status, entering into the market economy)?
- Does the project focus on using available technologies, labor, raw materials, and expertise?
- How are various groups in the society (women, minorities) involved or influenced by the project?

ANNEX C
Professional/Non-Professional Person Months Requirements
By Activity and Year

OUTPUT	Person/months		Professional(Non-professional)		
	Year 1	Year 2	Year 3	Year 4	Year 5
1. Increase and Maintenance Tech Capabilities	31.8 (10.1)	36.4 (10.1)	37.8 (10.1)	35.8 (10.1)	35.8 (10.1)
2. Information Services	18.7 (4.8)	21.4 (4.8)	22.24 (4.8)	21.04 (4.8)	21.04 (4.8)
3. Training Programs	35.5 (9.1)	40.66 (9.1)	42.25 (9.1)	40 (9.1)	40 (9.1)
4. In-country Tech Assistance	74.7 (13.4)	85.6 (13.4)	89 (13.4)	84.1 (13.4)	84.1 (13.4)
5. G.A.S.G.A.	1.9 (1)	2.1 (1)	22 (1)	2.1 (1)	2.1 (1)
6. Co-op Tropic Institute (Costa Rica)	16.8 (1)	19.2 (1)	20 (1)	19 (1)	19 (1)
7. Adm. Support	7.4 (8.6)	8.6 (8.6)	8.9 (8.6)	8.41 (8.6)	8.41 (8.6)
TOTAL Prof. Non-prof.	186.8 (48)	214 (48)	222.4 (48)	210.4 (48)	210.4 (48)

ANNEX D
Project Activity Funding Levels

OUTPUT BUDGET	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Increase & Maintain Tech Capabilities	\$156,500	188,258	213,660	209,311	229,060	996,789
Information Services	87,775	106,118	120,590	117,916	129,042	561,441
Training Program	166,585	201,543	229,040	223,950	245,080	2,118,953
In-country Tech Assistance	329,062	400,980	456,510	445,199	487,202	2,118,953
G.A.S.G.A.	10,832	12,718	14,380	14,165	15,500	67,595
Co-op with Tropical Institute	66,484	82,059	93,730	90,975	99,559	432,807
Adm. Support	59,762	69,503	78,030	77,650	84,975	369,920
TOTAL	877,000	1,061,179	1,205,940	1,179,166	1,290,418	\$5,613,703

ANNEX E

AGENCY FOR INTERNATIONAL DEVELOPMENT AND THE FOOD AND FEED GRAIN INSTITUTE COOPERATIVE AGREEMENT COST SHARING

ITEM	1980-1981		1981-1982		1982-1983		1983-1984		1984-1985	
	A.I.D.	F F G I	A.I.D.	F.F.G.I.	A.I.D.	F.F.G.I.	A.I.D.	F.F.G.I.	A.I.D.	F.F.G.I.
Staff Salaries	\$383,279	\$ 68,196	\$470,285	\$ 75,017	\$534,945	\$ 82,517	\$529,063	\$ 90,770	\$577,219	\$ 99,847
Fringe Benefits	59,060	11,423	71,760	12,565	82,666	13,822	80,848	15,204	88,914	16,224
Indirect Costs	207,283	39,252	255,359	43,178	291,427	47,495	300,686	52,245	328,404	57,470
Consultants	24,600	* 25,000	29,550	* 25,000	29,550	* 25,000	29,550	* 25,000	29,550	* 25,000
Transportation	73,500	-----	89,300	-----	108,580	-----	108,550	-----	119,670	-----
Allowance	41,292	-----	47,225	-----	53,146	-----	51,539	-----	59,035	-----
**Other Direct Costs	52,986	28,887	62,700	31,600	70,706	34,761	28,930	38,237	83,626	42,061
S.E.A.R.C.A.	35,000	-----	35,000	-----	35,000	-----	-----	-----	-----	-----
TOTALS	\$877,000	\$172,758	\$1,061,179	\$187,360	\$1,205,940	\$203,595	\$1,179,166	\$221,456	\$1,290,418	\$241,102

* KSU faculty consulting at no salary cost to Cooperative Agreement at estimated 217 day @ \$115/day.
 ** KSU sharing includes facilities, utilities, and equipment use.

NOTE: Figures calculated to include: 49.3% domestic overhead
 27.1% overseas overhead
 10.0% post differential
 10-15% inflation rate