

AID 1350-1X
(7-71)

PIO/T

DEPARTMENT OF STATE
AGENCY FOR
INTERNATIONAL DEVELOPMENT

PROJECT IMPLEMENTATION
ORDER/TECHNICAL
SERVICES

1. Cooperating Agency
Worldwide 3/7/607
2. PIO/T No.
731970-1122
3. Original or
Amendment No.
4. Project/Activity No. and Title
Study of Post Harvest Food Losses (29)

DISTRIBUTION

5. Appropriation Symbol
72-11X1023
6.A. Allotment Symbol and Charge
462-31-091-00-20-71
6.B. Funds Allotted to:
 A.I.D./W Mission
7. Obligation Status TA/OST, W. L. Eilers WLE
 Administrative Reservation Implementing Document
8. Funding Period (Mo., Day, Yr.)
From 10/15/76 12/14/77
9.A. Services to Start (Mo., Day, Yr.)
Between October 15, 1976 and
9.B. Completion date of Services
(Mo., Day, Yr.) 12/14/77
10.A. Type of Action
 A.I.D. Contract Cooperating
Country Contract Participating Agency
Service Agreement Other
10.B. Authorized Agent
AID/W

Estimated Financing		(1)	(2)	(3)	(4)
\$1.00=		Previous Total	Increase	Decrease	Total to Date
11. Maximum A.I.D. Financing	A. Dollars	None	\$160,000		\$160,000
	B. U.S.-Owned Local Currency				
12. Cooperating Country Contributions	A. Counterpart			FUNDS RESERVED BY AC/S	
	B. Other			POSTED 12/26/76 SER/PM/CSO	

13. Mission References

14. Instructions to Authorized Agent
SER/CM is authorized to execute a Task Order under Basic Order Agreement with BOSTID AID/csd-2584 to provide services reflected in this PIO/T.

The scope of work and budget are included as attachments A and B.

15. Clearances - Show Office Symbol, Signature and Date for all Necessary Clearances.

A. The specifications in the scope of work are technically adequate TA/AGR, E. Leng Date 9/3/76 TA/AGR, K. Bvergo Date 9/3/76	B. Funds for the services requested are available Date 9/23/76 TA/PPU/PPA, H. Vaitaitis
C. The scope of work lies within the purview of the initiating and approved Agency Programs TA/AGR, L. Hesser Date 9/3/76	D. TA/PPU/PPA, M. Mozynski Date 10/18/76
E. TA/AGR, D. Clark Date 9/3/76	F. TA/N I. Hornstein DATE

16. For the cooperating country: The terms and conditions set forth herein are hereby agreed to

17. For the Agency for International Development

18. Date of Signature

Signature and date:

Title:

Signature: John Gunning
Title: Chief, Program Div TA/PPU

10/18/76

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	Project/Activity No. and Title Study of Post Harvest Food Losses		

SCOPE OF WORK

9. Scope of Technical Services

A. Objective for which the Technical Services are to be Used To establish the nature and dimensions of the post harvest food loss problem, to summarize and evaluate available post harvest loss data and make recommendations for immediate use to reduce the losses.

B. Description

This proposal supports an NAS study which would (a) assemble, analyze and evaluate information currently available on the extent of losses of major food crops in developing countries and (b) suggest ways of reducing those losses. Methodologies will be suggested for obtaining this information and recommendations made for practical stopgap means to reduce food losses, based on available information -- taking into account technical considerations, financial viability and the economic and social feasibility. NAS will establish an expert multi-disciplinary panel, which, in turn, will employ experts and consultants to gather the required information. (See Attachment A-1 for definitions)

C. Technicians

(1) (a) <u>Number</u>	(b) <u>Specialized Field</u>	(c) <u>Grade and/or Salary</u>	(d) <u>Duration of Assignment (Man-Months)</u>
	Technical Personnel		13 work months
	Secretarial		6 work months

(2) Duty Post and Duration of Technicians' Services

National Academy of Sciences and worldwide visits to Developing Countries to obtain food loss information.

(3) Language requirements

N/A

(4) Access to Classified Information

N/A

(5) Dependents Will Will Not Be Permitted to Accompany Technicians

D. Financing of Technical Services

(1) By AID - \$ 146,200

(2) By Cooperating Country -

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20. Equipment and Supplies (Related to the services described in Block 19 and to be procured outside the Cooperating Country by the supplier of these services)

A. <u>(1) Quantity</u> <u>(2) Description</u>	<u>(3) Estimated Cost</u>	<u>(4) Special Instructions</u>
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Materials and Services	\$13,800	
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B. Financing of Equipment and Supplies

(1) By AID - \$ 13,800

(2) By Cooperating Country -

21. Special Provisions -

- A. This PIO/T is subject to AID (contracting) (PASA implementation) regulations.
- B. Except as specifically authorized by AID, or when local hire is authorized under the terms of a contract with a U.S. Supplier, services authorized under this PIO/T must be obtained from U.S. sources.
- C. Except as specifically authorized by AID/W, the purchase of commodities authorized under this PIO/T will be limited to the U.S. under Geographic Code 000.
- D. Other (specify): Prior to making visits to DCs, contractor will review plans with TA/AGR. Contractor will keep USAID Missions fully informed of proposed visits, and ask them to provide any suggestions they may have regarding timing and content of visits. Copies of trip reports will be provided to the TA/AGR Project Manager.

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22. Reports by Contractor or Participating Agency (Indicate type, content and format of reports required, including language to be used if other than English, frequency or timing of reports, and any special requirements).

1. A report of each steering committee meetings within 30 days of each meeting in 25 copies.
2. A report of the international working meeting within 30 days of the conclusion of the meeting in 25 copies.
3. Within 14 months of the start of the project a final report in 100 copies - as outlined in the anticipated results section of the attached work plan. In order for the schedule of follow on phases of this project to be maintained, the report schedule as outlined above must be closely followed. If it is necessary to hire consultants to complete reports on schedule this facility should be used.

23. Background Information (Additional information useful to Authorized Agent and Prospective Contractors or Participating Agency; if necessary cross reference Block 19.C(4) above.)

There are a number of efforts in progress to survey available published and unpublished information on the extent of food losses. It would be desirable for the NAS to undertake a "survey of surveys" to provide an overview of the present situation with respect to food losses.

24. Relationship of Contractor or Participating Agency to Cooperating Country and to AID

A. Relationships and Responsibilities

N/A

B. Cooperating Country Liaison Official

C. AID Liaison Officials

Keith Byergo, TA/AGR

Dr. Leng, TA/AGR

Dr. Hesser, TA/AGR

LOGISTIC SUPPORT

25. Provisions for Logistic Support	IN KIND SUPPLIED BY		FROM LOCAL CURRENCY SUPPLIED BY		TO BE PROVIDED OR ARRANGED BY SUPPLIER
	AID	COOPERATING COUNTRY	AID	COOPERATING COUNTRY	
A. Specific Items (Insert "X" in applicable column at right. If entry needs qualification, insert asterisk and explain below in C. "Comments")					
(1) Office Space	X (For	NAS Consultants)			
(2) Office Equipment					
(3) Housing and Utilities					
(4) Furniture					
(5) Household Equipment (Stoves, Refrig., etc.)					
(6) Transportation in Cooperating Country	X (As available)				
(7) Transportation To and From Country					
(8) Interpreter Services/Secretarial					
(9) Medical Facilities					
(10) Vehicles (official)					
(11) Travel Arrangements/Tickets					
Other: (12) specify)					
(13)					
(14)					
(15)					

B. Additional Facilities Available From Other Sources

- APO
 PX
 COMMISSARY
- OTHER (specify, e.g., duty free entry, tax exemption)

To assist NAS, the AID Technical Assistance Bureau provided support for an ad hoc meeting on post harvest food losses, held May 23 and 24, 1976. This meeting of approximately 20 specialists in fields connected with post harvest food losses in developing countries discussed definitions of losses and points in the food system where food losses are occurring. This information will be helpful to NAS during contract implementation activities.

c. Comments There is a serious, almost total, lack of knowledge about the quantitative extent of post harvest food losses in developing countries. There is need for a broad-gauged study of methodologies to estimate food losses, and to evaluate the efficacy of methods of reducing those food losses. Contact must be made with those responsible for the production, storage, processing, distribution and marketing of food among poorer families in LDCs, in many subsistence societies, those responsible peoples, and the women of the household. Persons knowledgeable of the poorer societies such as anthropologists, human geographers, and home economists as well as agriculturalists, educators, food dealers and community leaders should be surveyed. Only with awareness and involvement of those responsible for food handling at the lowest level will valid data and recommendations be generated. Nor without this involvement will there be an acceptance of new technology.

Definition of the Boundaries of the Study

For purposes of clarity, the terminology to be used in this study is herein defined:

Food - the wholesome edible materials that would normally be consumed by humans, measured on a moisture-free basis.

1. Durables (low moisture content food commodity)
 - a. Cereals - wheat, rice, maize, sorghum, millet, barley, etc.
 - b. Legumes - soybeans, drybeans, chickpeas, cowpeas, sesame, lentils, peanuts, etc.
 - c. Rootcrops - yams, sweet potatoes, white potatoes, taro, cassava, onions, etc.
2. Perishables (high moisture content food commodity)
 - a. Fruits - plantain, citrus, pineapples, coconut, etc.
 - b. Vegetables - tomatoes, squashes, etc.
 - c. Fish and other seafoods

Food Loss - Any change in the availability, edibility, wholesomeness of quality of the food that prevents it from being consumed by people.

The following food commodities should be excluded from study consideration, since "post harvest losses" of these products are special cases generally looked after by large commercial enterprises, and need no external assistance: coffee, cocoa, tea, sugar, bananas; meat, dairy and poultry products.

The level of effort will be apportioned among four commodity groups - cereals and root crops (60%), legumes (20%), perishables (20%).

Selection of commodities to be examined will be based on worldwide production data obtained from FAO Production Yearbook 1974, which identifies major crops of the world.

Qualitative vs. Quantitative Losses

A question arises as to what extent losses of food quality should be taken into account in the study. In the literature survey it is intended that all losses of food will be included—both quantitative and qualitative (although we expect little information to be available on qualitative losses).

Qualitative losses, or losses of wholesomeness, may be divided into two groups: (a) visible losses, such as mold, inert matter, "spoilage" or other undesirable quality changes that at some point may cause the food to be discarded, or (b) invisible losses of nutrients such as fats, vitamins, proteins, minerals. By and large, the nutrition community has not identified the latter category--losses of nutritional quality--as a priority problem.

Another problem with studying the nutrient losses is that until the food reaches the processing stage--i.e., from production through to storage, through the transportation and distribution system--it would be extremely difficult and costly to measure the losses. However, by contrast, it would

WORK PLAN

The available data must be summarized and evaluated, and recommendations made for model field studies of all stages of food production and movement to obtain the reliable loss data needed before practical intervention programs can be designed. This should include discussions with scientists and planners from both developing and developed countries. It should include contacts with those responsible for food production, storage, processing, distribution, and marketing at the lower levels of subsistence agriculture as well as with professional people knowledgeable in the social dynamics of subsistence agriculture. Examples of the kinds of model study to be developed include:

- losses occurring in the field; insect; rodent; and other mammals; bird (but not disease);
- losses in storage; and preservation; insect; rodent; bacteria; fungal;
- losses in distribution;
- losses occurring in processing - quality and quantity.

As women are responsible for post harvest as well as production activities in many developing societies, their view should be solicited and as far as possible, adhered to.

PROPOSAL

The Board on Science and Technology for International Development will establish a steering committee of approximately seven distinguished experts who have been involved in the problem of post harvest food losses and the social dynamics of subsistence agriculture. This committee will be responsible for the (1) conceptual framework of the study; (2) organization of an international working meeting currently planned to be held in March 1977, and (3) the presentation of a final report. It is anticipated that this committee will have participants associated with international organizations already concerned with food losses as well as members from developing countries.

In addition to attendance at the international working meeting the steering committee would meet approximately twice.

1. To review and discuss the conceptual framework of the study; the progress with the review of available information on the extent and amount of post harvest food losses of major crops in developing countries; the organization of the international working meeting; and
2. To review the results of the discussions of the international working meeting and make recommendations regarding critical information requirements; methodologies for obtaining needed information; use and adaptation of known technologies, and recommendations for research in the final report.

The international working meeting will be attended by approximately 30 individuals in addition to members of the steering committee, approximately half from the United States and the balance from other developed and developing countries. It will be composed of specialists in fields such as the following:

- Pest Control (insects, rodents, and other mammals, birds)
- Food Processing and Preservation
- Statistics
- Storage/Farmstead Structures
- Economics and Marketing
- Climatology
- Social Anthropology
- Fisheries
- Transportation
- Microbiology
- Analytical Methods
- Environmental aspects of farming and pest control.
- Home Economics
- Human Geographers
- Health & Nutrition Offices
- Marketing & Credit Coops
- Community Service Organizations (men & women)

It will subdivide into appropriate working groups which would focus on specific areas of concern such as post harvest food losses of cereal grains, root crops, and perishable commodities; losses due to insects, rodents and other mammals, birds, environmental factors, other losses; losses occurring in the humid tropics, in dry or semi-arid tropics, and in the tropical highlands; felt needs of people responsible for post harvest food activities at the subsistence level, particularly women; constraints to the adaption of new post harvest loss reduction technology. -- In each category there will be a review of the present state of knowledge about losses and their causes, available technology for reducing losses and its effectiveness, and recommendations for obtaining required information regarding loss estimation and improved ways of reducing losses in future pilot studies to be undertaken at a limited number of locations (perhaps one or two locations in each of the categories of climatic zone and crop type).

ANTICIPATED RESULTS

The resultant report will comprise individual sections on the following:

1. A survey or review of the published and unpublished information gathered mainly from existing surveys being undertaken by FAO, Tropical Products Institute, United Kingdom, etc. A consultant will analyze and annotate this information for the committee which will comment on the value of the information and the conclusions to be drawn from it.

2. Methodologies for estimating losses in different locations, arising from different causes, and in the major food crops; methodologies presently used to reduce food losses, and their efficacy; methodologies which may be required to reduce food losses.

3. Recommendations, identifying research needs, and for specific studies to be undertaken in a limited number of locations to gain information on the extent of losses, and on loss reduction.

The report will be published in 8,000 copies for free distribution to interested individuals and organizations principally in developing countries.

be relatively easy and, we believe, more meaningful to have the nutritional losses measured at the processing stage.

In summary, the literature survey will include all food losses, both qualitative and quantitative. Except for that, the remainder of the study will take into account the losses of nutrients only at the processing stage. In this latter part of the study, the Office of Nutrition, Technical Assistance Bureau, should be consulted by the study panel.

BUDGET

Estimate of Costs

August 1, 1976 - July 31, 1977

Personal Services

Professional	\$32,970	
Secretarial/Clerical	<u>5,300</u>	\$38,270

Fringe Benefits		3,700
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Travel Expenses

Domestic	\$11,150	
International	<u>37,450</u>	48,600

Communications & Shipping		5,100
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Materials & Services		13,800
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Indirect Costs		40,530
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Contingency Fund		10,000
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TOTAL		<u>\$160,000**</u>
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*Includes accrual for annual and sick leave, holidays, and other leave such as for jury duty, military service, and special personal leave.

**It is understood that the contract will provide for advance payments.

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		2. PIO/T No. 931-1122.11-31786A7	3. Original or Amendment No. 1
PIO/T	PROJECT IMPLEMENTATION ORDER/TECHNICAL SERVICES	4. Project/Activity No. and Title Study of Postharvest Food Losses, National Academy of Sciences -- AID/csd-2584, T.O. 23	

DISTRIBUTION	5. Appropriation Symbol 72-11X1023 ✓	6.A. Allotment Symbol and Charge 402-31-099-00-20-83 ✓	6.B. Funds Allotted to: <input checked="" type="checkbox"/> A.I.D./N <input type="checkbox"/> Mission	
	7. Obligation Status <input type="checkbox"/> Administrative Reservation <input checked="" type="checkbox"/> Implementing Document		8. Funding Period (Mo., Day, Yr.) From --- To 6/30/78	
	9.A. Services to Start (Mo., Day, Yr.) Between Continuing and ---		9.B. Completion date of Services (Mo., Day, Yr.) This PIO/T 6/30/78	
	10.A. Type of Action <input type="checkbox"/> A.I.D. Contract <input type="checkbox"/> Country Contract <input type="checkbox"/> Participating Agency Service Agreement <input checked="" type="checkbox"/> Other			DS/OST Task Order BOA
	10.B. Authorized Agent			

Estimated Financing		(1)	(2)	(3)	(4)
		Previous Total	Increase	Decrease	Total to Date
11. Maximum A.I.D. Financing	A. Dollars	160,000 a/			160,000
	B. U.S.-Owned Local Currency				
12. Cooperating Country Contributions	A. Counterpart				
	B. Other				

NOTED BY [Signature] 2-2-78
POSTED SER/FM/CSD

13. Mission References	14. Instructions to Authorized Agent This PIO/T authorizes SER/CM/COD/DSB to amend the Task Order, #23, AID/csd-2584 with NAS to extend the contract termination date to June 30, 1978 from March 14, 1978 at no cost, with the following specific provision: 100 final draft copies of the NAS report will be provided to AID no later than April 15, 1978. The time extension is specifically for final editing and publishing of the 8000 copies of the report required under the contract. All other provisions of the contract remain in effect without change. AID/csd-2584, T.O. 23; 931-1122.11; DS/AGR/CP a/ \$160,000 was reserved in PIO/T; only \$150,000 was obligated in Contract
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Clearances - Show Office Symbol, Signature and Date for all Necessary Clearances.

The specifications in the scope of work were technically adequate /AGR/CP, K. Byergo [Signature] Date: 1/18/78	B. Funds for the services requested are available DS/OST, H. Arnold [Signature] Date: 1/30/78
The scope of work lies within the purview of the initiating and approved Agency Programs /AGR, F. Williams [Signature] Date: 1/19/78	D. [Signature] Date: 1/26/78
/AGR, L. Hesser [Signature] Date: 1/23/78	F. DS/PPU/PPA, J. Ryan [Signature] Date: 2-2-78

For the cooperating country: The terms and conditions set forth herein are hereby agreed to. Signature and date:	17. For the Agency for International Development Signatures: Kenneth Milow Title: Chief, DS/PPU/PPA	18. Date of Signature 2/3/78
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