Proj. 931/122 (3)
PN-PD-AAD-275-21

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

TO BE COMPLETED BY ORIGINATING OFFICE

1. TRANSACTION ("X" appropriate)
[X] Original
[ ] Add

2. COUNTRY/ENTITY: TAB

3. DOCUMENT REVISION NUMBER

4. PROJECT NUMBER 931-11-130-264 1122

5. BUREAU
a. Symbol: TAB
b. Code: 08

6. ESTIMATED FY OF PROJECT COMPLETION: FY 77

7. PROJECT TITLE - SHORT (stay within brackets)
Food Loss Study

8. ESTIMATED FY OF AUTHORIZATION/OBLIGATION
a. INITIAL mo. 09 yr. 76
b. FINAL FY TQ

9. ESTIMATED TOTAL COST ($000 or equivalent, $1 =)

a. FUNDING SOURCE	FIRST YEAR FY ~~TQ~~ FY77 b. FX	c. L/C	d. Total	ALL YEARS e. FX	f. L/C	g. Total
AID APPROPRIATED TOTAL			160			160
(Grant)	( )	( )	(160)	( )	( )	(160)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
Other U.S. 2.						
HOST GOVERNMENT						
OTHER DONOR(S)						
TOTALS			160			160

10. ESTIMATED COSTS/AID APPROPRIATED FUNDS ($000)

a. Appropriation (Alloc. Code)	b. Primary Purpose Code	c. Primary Tech. Code	FY TQ d. Grant	e. Loan	FY 77 f. Grant	g. Loan	FY ____ h. Grant	i. Loan	ALL YEARS j. Grant	k. Loan
FN	191I	010	160						160	
		TOTALS	160		-	-			160	
11. ESTIMATED EXPENDITURES			20		140				160	

12. PROJECT PURPOSE(S) (stay within brackets) [ ] Check if different from PID/PRP

Develop project design for a four year program concerned with reducing food losses.

13. WERE CHANGES MADE IN BLOCKS 12, 13, 14, or 15 OF THE PID FACESHEET? IF YES, ATTACH CHANGED PID FACESHEET.

[ ] Yes [X] No

14. ORIGINATING OFFICE CLEARANCE

Signature: Leon F. Hesser

Title: Director, Office of Agriculture, TAB

Date Signed: mo. day yr.

15. Date Received in AID/W, or For AID/W Documents, Date of Distribution: mo. day yr.

AID 1330-4 (7-75)

PAF 11-17-78

PROJECT STATEMENT

A. Project Summary

1. Statistical

Project Title	Study of Post Harvest Food Losses
New or Extension	New
Duration of Project	Twelve months - August 76 - July 77
Contractor	National Academy of Sciences
Total Estimated Cost	$160,000
Project Manager	Keith M. Byergo, TA/AGR

2. Narrative Summary

This project 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 (DCs) and (b) suggest ways of reducing those losses. On the basis of the information analyzed and evaluated, needed information will be identified, and methodologies suggested for obtaining this information, in order to establish the baseline required as a foundation for programs designed to reduce these post harvest food losses. Recommendations will be made for practical stopgap means to reduce food losses, based on currently available information, and taking into account technical considerations, financial viability and economic and social feasibility. This project is the first stage of what is currently conceived as a multi-stage study to be carried out over a three to four year period at a cost of approximately $1 million. This stage will provide guidelines for the larger project.

Under this proposed study -- in order to obtain the currently available and required information for reducing losses in DCs -- NAS will establish an expert multi-disciplinary panel which, in turn will employ experts and consultants to gather the required information.

3. **Background**

Although hunger and famine have been constant afflictions in the developing world, and despite a great deal of discussion of food losses in developing countries, there appears to be no up-to-date, comprehensive, compilation of data on the subject. Scattered detailed studies have been made and are underway -- but available reliable data are totally inadequate to assess the dimensions of the problem on either a geographical or commodity basis.

Many of the projections of available food supply are based on agricultural production figures. Therefore, the current optimism among many agriculturists on the availability of food in the near future may be ill-founded if losses are anywhere near what they are expected to be. Furthermore, food losses can be expected to be compounded in specific areas of increased production if as yet unidentified means are not employed to cope with the increased problems of harvesting, storage, and handling.

As a result of the President's request to the Academy to undertake a study of research needs to contribute to a solution of the world's food and nutrition problems, an ad-hoc group was convened to examine food losses and their impact on world food supply. This group concluded that the situation is serious enough to warrant a comprehensive, phased program of study and action.

At a subsequent meeting in May of 1976 a group of international food loss experts were assembled by NAS to make recommendations for the initial effort in attaching the problem of post harvest losses. Their concensus was that (1) a serious lack of information on the quantity of losses existed, (2) coordination and summation of current surveys was required and (3) an evaluation of the efficacy of available technology particularly in relation to its financial and economic viability was needed.

B. Research Purpose and Expected Products

1. Purpose

To summarize and evaluate available post harvest loss data, develop systems for acquiring missing information and methodologies for assessing losses, and make recommendation of available technology for immediate use to reduce post harvest losses.

2. Objectives and Expected Products

The project proposes to accomplish the following:

A. Establish a workable and acceptable definition of loss after discussion and evaluation of purposed definitions;

B. A summary and evaluation of available post harvest loss data;

C. Identify and quantify losses (that is, differentiate between "hard and soft' data);

D. Identify major causes of loss (vectors, physical factors, etc.);

E. Identify the methodology used to arrive at loss figures;

F. Evaluate the methodology and the reliability of the loss data;

G. Determine efficacy of currently available post harvest loss reduction methodologies;

H. Formulate recommendations on:

1. loss definition
2. methodology to be followed in model field data gathering surveys
3. critical areas to be studied--gaps and priorities
4. methodologies for immediate use to reduce post harvest losses.

The first item (Item A) would be one of the tasks of the expert panel at its initial meeting. The next six items (Items B, C, D, E, F, & G) would be performed by commissioned experts, while the final recommendation (Item H) would be the responsibility of the expert panel and would constitute the final report.

The report will be used as input for a follow-on multi-stage (3-4 years) study on Reduction of Post Harvest Food Losses. Selected countries representing various environmental regions will be selected for survey and intervention activities.

C. State-of-the-Art

A.I.D. and other development agencies both in the U.S. and abroad have had post harvest loss activities as part of their development programs. However, the emphasis has been more on production elements than reducing food losses. This lack of emphasis or knowledge of means to introduce and teach post harvest loss technology has resulted in a low rate of adoption. This is true in many cases even where large sums have been spent on storage construction. The village and farm level have had the lowest rate of adoption and yet here is where all grain is handled and 70 to 75% remains until consumption.

Technology exists, as in the case of Australia, to reduce cereal grain losses below the one per cent level. The incentives and training must be in place and accepted at the farm level and all along the food delivery chain before such low loss levels can be achieved.

D. Project Design and Work Plan

The NAS Board on Science and Technology for International Development proposes to carry out the first stage of a multi-stage study. It will establish a steering committee of approximately seven distinguished experts who have been involved in the problem of post harvest food losses. 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 a member from a developing country.

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

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. 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 examination 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).

E. Linkages

Close coordination will be developed in this project with GASGA, LIFE/AACC and other U.S. and international institutions involved with post harvest loss activities. This will be done during literature reviews and at the three proposed meetings, one of which is international in scope. A part-time consultant will have major responsibility for literature reviews and meeting organizations.

F. General Appraisal

NAS is uniquely suited to undertake this type of project through its ability to call in the services of the most appropriate specialists from throughout the United States and international communities of natural and social scientists to participate in an inter-disciplinary examination of these problems. The problem of post harvest food losses has gained attention at the highest levels of the U.N. and World Food Councils. Many programs are being initiated by institutions with expertise in post harvest activities. This project will provide summations and evaluations of available data necessary to provide relevance to other programs.

G. **Budget**

NATIONAL ACADEMY OF SCIENCES - NATIONAL RESEARCH COUNCIL

Commission on International Relations

Study on Food Losses

Estimate of Costs
August 1, 1976 - July 31, 1977

Personal Services		
Professional	$32,970	
Secretarial/Clerical	5,300	$38,270
Fringe Benefits		3,700
Travel Expenses		
Domestic	$11,150	
International	37,450	48,600
Communications & Shipping		5,100
Materials & Services		13,800
Indirect Costs		40,530
Contingency		10,000
TOTAL		$160,000**

*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.

ADDENDUM TO PP - STUDY OF POST HARVEST FOOD LOSSES

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

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.

TA/AGR
9/10/76

931-1122

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I

1. TRANSACTION CODE: C (A = ADD, C = CHANGE, D = DELETE)

PAF

2. DOCUMENT CODE: 5

3. COUNTRY/ENTITY: DS/AGR RDA 29

4. DOCUMENT REVISION NUMBER: 2

5. PROJECT NUMBER (7 digits): 931-1122.11

6. BUREAU/OFFICE: A. SYMBOL: DS; B. CODE: 88

7. PROJECT TITLE (Maximum 40 characters): Study of Post Harvest Food Losses

8. PROJECT APPROVAL DECISION: A (A = APPROVED, D = DISAPPROVED, DA = DEAUTHORIZED)

ACTION TAKEN: 10

9. EST. PERIOD OF IMPLEMENTATION: YRS. 00 QTRS. 2

10. APPROVED BUDGET AID APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. 1ST FY Thru 9/30/78 F. GRANT	E. 1ST FY G. LOAN	H. 2ND FY I. GRANT	H. 2ND FY J. LOAN	K. 3RD FY L. GRANT	K. 3RD FY M. LOAN
(1) FN	191 I	010	–	150	–	0	–	0	–
(2)									
(3)									
(4)									
TOTALS				150	–	0	–	0	–

A. APPROPRIATION	N. 4TH FY O. GRANT	N. 4TH FY P. LOAN	Q. 5TH FY R. GRANT	Q. 5TH FY S. LOAN	LIFE OF PROJECT T. GRANT	LIFE OF PROJECT U. LOAN
(1) FN	0	–	0	–	150	–
(2)						
(3)						
(4)						
TOTALS	0	–	0	–	150	–

11. PROJECT FUNDING AUTHORIZED (ENTER APPROPRIATE CODE(S)) 1 = LIFE OF PROJECT, 2 = INCREMENTAL LIFE OF PROJECT: GRANT 2

C. PROJECT FUNDING AUTHORIZED THRU: FY 77

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED ($000)

A. APPROPRIATION	B. ALLOTMENT REQUEST NO. C. GRANT	D. LOAN
(1)		
(2)		
(3)		
(4)		
TOTALS		

13. FUNDS RESERVED FOR ALLOTMENT

TYPED NAME (Chief, SER/FM/FSD)

SIGNATURE

DATE 11/27/78

14. SOURCE/ORIGIN OF GOODS AND SERVICES: [X] 000 [ ] 941 [ ] LOCAL [ ] OTHER

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

Extend the Grant to December 31, 1978 to permit the completion of the editing and publishing the final report previously approved

FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE MM DD YY	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE MM DD YY

Project Authorization and Request
for Allotment of Funds
Part II

ENTITY: .DS/Bureau

PROJECT: NAS Study of Post Harvest Food Losses

PROJECT NUMBER: 931-1122.11

I hereby authorize a six month extension from June 30, 1978 to December 31, 1978, requiring no additional funds, of the research project, Study of Post Harvest Food Losses, with the National Academy of Science. This extension will provide the additional time required by the contractor to complete the work as specified in the existing contract.

Tony Babb
Deputy Assistant Administrator
Food and Nutrition
Development Support Bureau

Date 11/17/78

Clearances:
DS/AGR/AB:S.Greig 11/6/78
DS/AGR/AB:W.Rogers 11/6/78
DS/AGR:M.Mozynski 11/6/78
DS/AGR:D.Peterson 11/6/78
DS/PPU:RSimpson

References:
1. Action Memo: Peterson to DS/DAA/FN

11/6/78

ACTION MEMORANDUM FOR THE DEPUTY ASSISTANT ADMINISTRATOR
FOR FOOD AND NUTRITITION, DEVELOPMENT SUPPORT BUREAU

THRU: DS/PO, Robert Simpson RS for

FROM: DS/AGR, Dean Peterson Dean Peterson

Problem: Your approval is required for a six month unfunded extension of the project "Study of Post Harvest Food Losses:" with the National Academy of Science.

Discussion: This project was initiated in FY 1977. The total contract for the fully funded project was $150,000. Original intentions had been to fund the project earlier and the National Academy of Sciences (NAS) had geared up to handle the project at an earlier date. When funding was delayed NAS had to curtail its original planning and later reorient its staffing to handle the project as a result initial progress was much slower than originally planned. Additionally the contract calls for the publication of 8000 copies of a final report "Post Harvest Food Losses in Developing Countries:" and the final editing and publishing has taken considerably longer than NAS expected.

The purpose of the grant was to assess current levels of post harvest food losses in the developing countries and to recommend appropriate methods of intervention. One hundred copies of a final draft report have already been delivered to DSB under the contract. The analysis by NAS is both thorough and competent. The current delay in fulfilling the contract is in final publishing of the 8000 copies of the report.

DS/AGR feels strongly that this requested extension is both justified and appropriate for terminating the project in the most productive manner possible.

Recommendation: That you approve this six month unfunded project extension by signing the PAF enclosed herein.

Approved: Tony Babb

Disapproved: _____

Date: 11/17/78

DS/AGR/AB:WSGreig:ap:11/6/78:X58995