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STUDY ON POST HARVEST FOOD LOSS

Minutes

Steering Committee Meeting

June 8-9, 1977

Philadelphia, Pennsylvania

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STUDY ON POST-HARVEST FOOD LOSS
Minutes of Steering Committee Meeting
Philadelphia, Pa., June 8-9, 1977

June 8

A list of participants and guests at this meeting is attached.

E.R. Pariser chaired the discussions.

Michael Dow opened the meeting by describing the origin and purposes of the study. An informal NAS group met at the Massachusetts Institute of Technology in 1976 to review state of knowledge concerning post-harvest food losses for the Academy's World Food and Nutrition Study. They concluded that the problem of food loss in developing countries is critical. The problem is compounded by lack of information on the extent of actual losses and a consequent inability on the part of developing countries and technical assistance organizations to determine the best allocation of resources to reduce those food losses.

The purpose of the NAS study is to consolidate available information on food losses and loss estimation methodology, concentrating on major food crops in LDCs. The study will include: a) a bibliography covering the reliability of existing loss information: b) an assessment of the state-of-the-art of loss estimation methodology: and c) a discussion of technologies of loss reduction. It is hoped that the survey of technologies may lead to the formulation of a concept of "sound conservation technology." The study also will examine policies and practices relating to education, government, financial programs, and other matters that affect food conservation.

Keith Byergo of AID was asked to describe AID food loss efforts. He said they date back to Secretary Henry Kissinger's proposal that by

1985 world post-harvest losses be reduced by 50 percent. Much post-harvest loss reduction technology has existed by some time. However, as the stress has been on food production, these technologies have not been given much emphasis. Further, the social and economic aspects of food loss need to be explored; for example, in Africa much of the agricultural work is done by women, yet training programs in agriculture generally involve men. As food increasingly has moved into commercial trading chains, losses have intensified. Traditional on-farm practices have been reasonably good, however,

In response to the question, "What, ideally, would AID like to see from this study?", Byergo replied that AID's aim is to obtain a straight forward, simple methodology for going into a country and making an estimate of food losses. While this may be an overly simplistic answer, that is the direction they want to take.

Byergo added that price structures are an important factor affecting a farmer use of post-harvest conservation technology. If prices of agricultural commodities are maintained at an artificial low to keep food prices down, the farmer will soon see that it doesn't pay to make an extra investment in loss reduction.

AID also is looking for suggestions on activities that offer the best potential for getting quick loss reduction for the least investment.

The chairman then discussed the timetable for the major working meeting of various specialists that will take place as part of this study. With completion of the study scheduled for spring 1978, this meeting

should be held perhaps by mid-October. Therefore, necessary preparations (such as invitations to participants) will need to be completed by the end of July.

The organization of the study report might follow this general structure:

- genesis of the study
- clear statement of purpose
- definitions and discussion of boundaries of the study
- chapter on grains including subdivisions on:
 - loss estimation
 - social, cultural, and economic factors of losses
 - loss reduction technology in selected regions
 - policies, practices, and skills needed for food conservation
 - recommendations on research activities and the most appropriate intervention policies
- chapters on legumes and tubers (subdivisions as in grain)
- chapters on fish and perishables (subdivisions as in grain)

Certain members of the steering committee might take editorial responsibility for these chapters, using the fall working meeting to consult with appropriate specialists.

Daisy Tagliacozzo said that rather than rely exclusively on specialists, the report needs generalists who can integrate the experience of technicians, economists, social scientists, etc.

Michael Dow cautioned that the study might get diverted by attempting to be too comprehensive and by relying on scientific work that may not yet

have been done; it should be a consensus of the wisdom and experience of knowledgeable and credible people.

Gail Harrison suggested that, if AID is looking for a model of how one deals with loss problems in a variety of countries, commodities may represent an overly narrow approach. One could look at food loss vectors, for example, just as easily.

William Furtick described a University of Hawaii study of agricultural and natural resource development. After defining goals and identifying constraints in achieving the goals, the study was broadened to consider the costs, the time frame, and the individual actions necessary to overcome the constraints, as well as the probability of success.

It was suggested that a study report might have two parts -- one that deals with the various questions suggested earlier concerning specific commodities and one that deals with issues of analysis and approaches to the broader policies dealing with food loss.

In response to a member's concern that AID may be looking for a rather narrow manual of site-specific assessment methodologies, Byergo emphasized that AID is not looking for site-specific methodology, but on the contrary, is seeking a broad approach to loss estimation methodology that is generally adaptable to specific situations.

A point then was raised on whether household food loss should be excluded from the study. That loss often is the most expensive, since the processing has already been done. Pariser replied that although he agreed entirely, he is concerned that the study may become too complex; certain rather arbitrary boundaries must be drawn to keep it manageable.

A number of related proposals on food loss studies have been made by various groups, but haven't been funded by AID or FAO. Max Milner suggested that these proposals might be helpful to the NAS study if they could be made available.

The Harris-Lindblad study for The League of International Food Education (which concentrates on cereals) can be used to complement the NAS study. It was also suggested that FAO's material on this subject be examined. A.A.C. Hysmans described the FAO study, which concentrates on major foods, especially grains. FAO feels that in general, loss prevention technologies exist, but the problem thus far has been lack of training and management know-how. For the most part, FAO concentrates on small-scale, on-farm technologies because 70-75 percent of the world's food is grown by the people who also eat it. Training is one of the high priority areas for FAO programs, since there is a global shortage of middle-level manpower. FAO's field emphasis is on national programs, with considerable input over a long period of time.

The discussion turned to the proposed boundaries of the study. The question was raised concerning the inclusion of fish in the study approach with other commodities. James said that, in general, he feels that common approaches may be used, especially from the point of landing where similarities to fruits and vegetables begin. Problems of wastage of the by-catch are significant in many regions, causing large losses. Fish losses are harder to assess, but the solutions to the problem may be similar to those applied to other products.

The study committee must be careful not to "re-invent the wheel." The topic of post-harvest food loss has been much studied with little

practical advance. The emphasis on motivation for conservation is the only new factor in the study, said one observer.

A discussion of the exclusion of dairy products and meat from the study followed. Dow said that participants in the organizational meeting in 1976 felt that organizing and marketing these products involved a higher level of complexity than with other foods. Byergo added that in LDCs meat is mostly stored live; therefore, wastage is extremely low since the people butcher only what they plan to consume that day. Further, these products affect only a small segment of the population. Dwight Brothers suggested appending an explanatory footnote in the report to this effect.

Gail Harrison advised that the study address the need to assess the impact of food loss on nutritionally vulnerable groups. Malnutrition, after all, is the basic problem related to food loss.

It was pointed out that, in some cases, governments are interested in remedying the food loss situation mainly to increase exports rather than to raise the local level of nutrition.

Noel Jones questioned the proposed exclusion of some pre-harvest causes of postharvest losses from a consideration of possible remedial action on losses. A discussion followed on the effects of mold or insects on maize before harvest, fungus contamination of groundnuts while still in the ground, inherent storage characteristics of various crops, and breeding maize for good storage qualities. Edward Ayensu said that the most productive approach may be to narrow the study boundaries somewhat, and point out these problems and exceptions in the introduction.

It was suggested that other disciplines, such as epidemiology,

may offer interesting models for rapid assessment of problems. These models may be relevant to food loss assessment.

A general discussion ensued on definitions and boundaries and possible objections to the proposed study outline. Brothers felt that a qualifying sentence or explanation is needed to recognize potential economic loss (undelivered fish, for example) as a supplement to strict measurement of loss by weight.

In the afternoon session, the following outline of the study report was discussed:

Chapters

1. Introduction

Origin of study
Definitions
Boundaries
Profile of producer-to-consumer systems for food

2. Loss Estimation Methodology

Bibliography summary
Commodities estimates and estimation methodologies

3. Socioeconomic Aspects of Post-Harvest Food Losses

Investment alternatives
Marketing systems
Labor organization

4. Intervention Strategies

Technology (discussed on the basis of commodities)
Management

5. Recommendations on Policies and Practices

Subsidies, nutritional aspects, price controls, training and extension, coordination (internal and external)

Appendices to the report might include: guidelines for conducting specific studies on food loss; and guidelines on cost-benefit analysis; food loss prevention (and incentives).

The report should address the issue of reducing food loss whenever possible and note solely as a result of hardheaded cost-benefit analysis.

The fall meeting probably should be held in early November for perhaps three days, at which time drafts of chapters of the study report will be reviewed. A steering committee meeting will follow in early January, to go over the revised draft.

The discussion turned next to persons and information that might provide useful input to the study. The following names were mentioned as possible consultants on the economics chapter of the report:

Charles French, Purdue
Charles Hanrahan, USDA
Dana Dalrymple, USDA
Regina Ziegler, Tufts University
Carl Gotsch, Ford Foundation (with African experience, good on cost-benefit aspects)
Walter Falcon, Stanford University, Food Research Institute
Peter Timmer, Harvard

Additional names were put forward as possible consultants for other aspects of the study:

Jim Austin, Harvard Business School (on systems and marketing)
Wally Falcon, Stanford University Food Research Institute
Tom Marchioni, anthropologist at Case Western Reserve (in September)
Jim Goering, International Bank for Reconstruction and Development
Ernie Pastastico, University of Philippines at Los Banos (information on perishables)

The University of Hawaii has a considerable bibliography on root crops; other sources are the international agricultural research centers, CIP, CIAT IITA. The U.S. Department of Agriculture has done studies on transportation losses.

The International Development Research Center has a directory of food

research institutes in Southeast Asia that lists their research projects. The Food and Agricultural Organization of the UN has updated a directory of food technology institutes. The Organization of American States may have a similar directory. These institutions should be informed about the NAS study.

Fenton McHardy mentioned the energy implications of postharvest food loss activities, suggesting that David Pimentel may have some ideas on the matter.

Pariser noted that multinational corporations such as Unilever and Nestle have money accumulating in LDCs and would like to use these funds in the countries concerned. Such companies might have helpful information or project ideas on food loss.

Dow asked the committee to send him any papers, references, etc., that bear on the chapters of the study report. He also asked for the names of other persons who are good sources of information and other contributions. The Inter-American Institute of Agricultural Sciences (IICA) meeting in August, 1977, in Santo Domingo and the ECA/FAO meeting in October, 1976, in Monrovia may provide material relevant to the study, it might be useful to have a staff member or steering committee member attend these meetings.

June 9

Ayensu prepared a draft outline of a form that might be sent to potential contributors of information to the study. The outline follows:

1. What are the causes of loss and the context of the agricultural economic system in which the loss occurs?

2. Estimation of the extent and nature of food loss at different stages within boundaries proposed for the study -- what is known?

Estimation methodology

- how are losses measured?
- reliability of information
- rough estimate of losses with comparative importance

3. What is being done to reduce losses? What technologies are available on the farm/village level or at the cooperative/government regional level? What are the other factors in loss reduction (socioeconomic, education/extension, etc.)?

4. What needs to be done to conserve food?

- methodologies
- estimation
- reduction
- other policies and practices

The discussion of the information form raised the point that contributors should be asked to describe the system context in which a particular food loss occurs. Description of the system would include these aspects:

1. Commodity (with local and Latin names if possible)
2. Commodity importance as a food item
3. Processes (operations) to which commodity is subjected within study boundaries
4. Causes of losses and context of system in which losses occur
5. Estimation of losses at different stages within the study boundaries: what is known? Methodology (rough estimate): what is known?

In response to questions about who would receive the information form, it was proposed that it be sent mainly to persons who have not already contributed to such studies as those of FAO, TPI, etc. Information is especially needed about commodities other than grains.

Malcolm Bourne asked whether the contributors should be requested to estimate the minimal level of loss that would exist with good conservation practice. Dante DePadua said that in the Philippines, 10 percent loss of rice probably is a realizable target. He pointed out that economic loss can take place even though weight loss may not occur. In Asia, where rice is in deficit, rice of poor quality may be sold and consumed, but with considerable economic loss.

Pariser suggested, and the committee agreed, that the question on what is being done to reduce losses should also consider what may have been done in the past and the successes and failures.

The information form, said Milner, might also lead to suggestions on needed research.

Discussion then followed on the commodities to be considered in the study. The following items seem to be the most significant although the list probably will be modified:

Commodities

Paddy (rough rice, wet and upland)
Cassava
Maize
Wheat
Sorghum
Coconut
Yam
Millet
Food Legumes
Plantains

Citrus
Bananas
Mangoes
Vegetables (tomatoes, onions, peppers, green vegetables)
Fish (and other aquatic produce)
Cocoyam, Taro and Sweet Potato
Irish Potato

Huysmans suggested using the FAO Production Yearbook for commodities lists.

Dow asked steering committee members and guests to suggest as soon as possible names of persons to whom the information form should be sent. The form should be distributed widely and sent out as quickly as possible. Suggestions also are needed on persons who should be invited to the fall working meeting.

As the meeting came to a close, several future steps in the study were reviewed. The NAS staff will draft a covering letter and final version of the information form and start the distribution process. Moreover, the staff will draft and gather material for the rough version of the proposed chapters of the report. Steering committee members with "watching brief" for the various chapters are: Chapter 1 -- Pariser; Chapter 2 -- Pedersen, Huysmans, Ayensu, Bourne (with help from TPI); Chapter 3 -- Harrison.

It was agreed that if a suitable meeting place is available, the three-day fall working meeting will be scheduled during the week beginning October 31.

POST-HARVEST FOOD LOSSES

Attachment 1

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FOOD LOSSES MEETING
JUNE 8-9, 1977

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POSTHARVEST FOOD LOSSES

Attachment 2

Detailed Outline of Postharvest Food Loss Study Report

I. Introduction

- A. Genesis
- B. Scope and Purpose
- C. Definition
- D. Boundaries
- E. Taxonomy of Differential Types of Postharvest Utilization/Marketing Systems
 1. By degree of producer utilization vs. producer-consumer
 2. By degree of private entrepreneurship vs. governmental bureaucracy
 3. By degree of capitalization and administration of transport, distribution, infrastructure facilities.

II. Loss Estimation: Evidence and Methodology

- A. Appraisal of Available Literature and Ongoing Research
 1. By commodity of interest
 2. By geographic areas and individual countries
 3. By natural causes (moisture, rodents, etc.)
 4. By effectiveness of pertinent technologies (drying, chemical controls, etc.)
- B. Conceptual and Data Problems
 1. Distinction between Physical and Economic Measures of Loss
 - a. nutritional criteria vs. cost/benefit criteria
 - b. implication and basis for objectives and opportunities for Interventions
- C. Generalized Methodology for Measuring for Estimating Postharvest Losses

1. By criterion of loss employed
2. By type of commodity, environmental circumstances, technological alternatives, etc.

III. Socioeconomic parameters

A. Cultural Factors Pertaining to Postharvest Food Losses

1. General belief systems
2. Forms of social organization
3. Manpower migration and settlement
4. Political organization

B. Economic Factors Pertaining to Postharvest Food Losses

1. From viewpoint of individual producers and consumers
2. From viewpoint of national governments
3. Private vs social cost analysis
4. Political/economic parameter of public policy

IV. Intervention Opportunities

A. Technology Application

1. Research
2. Training

B. Infrastructural Investments

1. Transport and storage
2. Marketing and distributional facilities

C. Management and Manipulation of Public Policy Variables

1. Private enterprise vs. governmental administration
2. Cost/price relations and provision of suitable incentives
3. Crucial role of management

7. Practical Recommendations

- A. Types and Degrees of Postharvest Food Losses Warranting Priority Attention
 - 1. Identification
 - 2. Appraisal
- B. Recommendations to Developing Country Governments
- C. Recommendations to Technical Assistance Agencies
- D. Determination of Appropriate Balance in Efforts Directed toward Production Increase and Loss Reduction

Appendices

- I. Guidelines for Measuring and Appraising Postharvest Food Losses Applicable to Individual Commodities and to Particular Countries.
- II. Generalized Cost/Benefit Analytical Framework Appropriate for Decision Making Regarding Investments in Postharvest Food Loss Reduction.
- III. Comprehensive Annotated Bibliography of Existing Literature Pertaining to Postharvest Food Losses, Categorized by Commodity, Country, or Region, Causes and Pertinent Technological and/or Policy Interventions.