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AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

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7. PROJECT TITLE (Maximum 40 characters): Storage, Marketing, Processing Vegetables Fruit

8. ESTIMATED FY OF PROJECT COMPLETION: FY 84

9. ESTIMATED DATE OF OBLIGATION: A. INITIAL FY 79; B. QUARTER 4; C. FINAL FY 83 (Enter 1, 2, 3, or 4)

10. ESTIMATED COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY B. FX	FIRST FY C. L/C	FIRST FY D. TOTAL	LIFE OF PROJECT E. FX	LIFE OF PROJECT F. L/C	LIFE OF PROJECT G. TOTAL
AID APPROPRIATED TOTAL	600	–	600	2,250	–	2,250
GRANT: FN	(600)	(–)	(600)	(2,250)	(–)	(2,250)
LOAN	( )	( )	( )	( )	( )	( )
OTHER U.S. 1.						
OTHER U.S. 2.						
HOST COUNTRY						
OTHER DONOR(S)						
TOTALS	600	–	600	2,250	–	2,250

11. PROPOSED BUDGET APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. 1ST FY 79 F. GRANT	E. 1ST FY 79 G. LOAN	H. 2ND FY 80 I. GRANT	H. 2ND FY 80 J. LOAN	K. 3RD FY 81 L. GRANT	K. 3RD FY 81 M. LOAN
(1) FN	179 I	333		600	100			500	
(2)									
(3)									
(4)									
TOTALS				600	100			500	

A. APPROPRIATION	N. 4TH FY 82 O. GRANT	N. 4TH FY 82 P. LOAN	Q. 5TH FY 83 R. GRANT	Q. 5TH FY 83 S. LOAN	LIFE OF PROJECT T. GRANT	LIFE OF PROJECT U. LOAN
(1)	550		600		2250	
(2)						
(3)						
(4)						
TOTALS	550		600		2250	

12. IN-DEPTH EVALUATION SCHEDULE: MM 08 YY 81

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

[1] 1 = NO, 2 = YES

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE

TITLE: Dr. Dean F. Peterson
Director, Office of Agriculture-DSB

DATE SIGNED: MM DD YY

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM DD YY

AID 1350-4 (3-76)

PROJECT PAPER

STORING, PROCESSING, AND MARKETING OF VEGETABLES AND FRUIT

PROJECT NO. 931 1323

Agribusiness Division
Office of Agriculture
Bureau for Development Support
March 1979

PROJECT PAPER OUTLINE

Table of Contents

Table of Contents

Preface

The approved PID "Storage, Processing and Marketing of Vegetables and Fruit" was circulated to all Missions for analysis and estimates of Mission use of the Technical Services to be offered under the proposed project. Twenty-three Missions and ROCAP responded. Of these responses ROCAP and 16 Missions gave strong or substantial support to the proposed project. These Missions were: Lesotho, Barbados, Costa Rica, Pakistan, Ecuador, Syria, Ethiopia, Egypt, Kenya, Burundi, Panama, Guyana, Nicaragua, El Salvador, Guatemala and Paraguay. Three additional Missions (Morocco, Tanzania and Tunisia) supported the project but would not predict immediate usage of the technical services team. Four Missions gave the project low priority or estimated little forseeable needs. These were Niger, Bangladesh, India and Indonesia. Quantification of potential Mission use of technical services under the proposed project were not precise, however, from the responses perhaps 10 - 15 man years of technical services to Missions were indicated over the next four to five years. Mission responses are attached as Annex C.

PART I. - Summary and Recommendation

A. Recommendation

It is recommended that $2,250,000 in grant funds be approved to finance a five-year General Technical Services Project to reduce postharvest food losses, to increase marketing efficiency, and to assist in agribusiness development in roots, tubers, vegetables and fruits in the LDCs. The obligation schedule would be as follows: FY 1979 - $600,000 for the first two years ($100,000 for FY 1979 and $500,000 for FY 1980); FY 1981 - $500,000; FY 1982 - $550,000; and FY 1983 - $600,000. Subject to the availability of funds, the project will start in FY 1979.

B. Summary Description

This project provides technical assistance to missions and host LDC governments in reducing postharvest food losses and developing programs to improve marketing efficiency and increase agribusiness development involving roots, tubers, vegetables, and fruit crops. Roots, tubers, vegetable, and fruit crops (Horticulture Crops - hereafter abbreviated as "Hort Crops") provides the basic diet for 400 to 500 million people in the LDCs and are a major dietary supplement for most others. Postharvest food losses of these perishable products are estimated to average over 20 percent of the harvested crops. Marketing systems, including storage, handling and processing for the products are often antiquated and under continually increasing pressure due to rapid urbanization in many developing countries. The project provides a team of economists and/or marketing specialists, food technologists, engineers, and biological scientists to assist

missions and host governments in assessing and reducing postharvest food losses by improving storage, processing, transporting, wholesaling, and retailing of these perishable products. The team will assist in economic policy analysis relating to these crops and products, and provide prefeasibility analysis of proposed or recommended changes in organization, structure, and/or facilities for improving marketing efficiency. The team will also provide prefeasibility assessment or analysis of agribusiness development in these crops including potential for new or improved storage, handling, and processing and local, national, or international marketing of the perishable crops or products.

The project will include a continuous global review of new or improved techniques, methods, and processes used in storage, processing, marketing, and agribusiness development in roots, tubers, vegetables, and fruits and their products with emphasis on those aspects which apply directly to LDCs. Generalized training will be provided including supervision of graduate students and the scheduling of specialized individualized training as requested by missions to fulfill needs of the LDCs.

Analysis of host LDC government institutional arrangements (government organization, structure, and management) for dealing with problems of Hort Crops marketing will be conducted on request of the host government and recommendations for changes will be made. At the end of five years, the project organization, administration, and services offered to the mission will have been sufficiently tested to determine whether the

project is meeting its original objectives. Whether the project continues beyond five years will be based on the continuing need as expressed in mission requests for project services.

At the end of the five-year project, a service will be in place which has a cadre of experienced qualified personnel, has the latest technical and experience information available, and has widely analyzed the LDC situations for which the service is to be provided. The project team, if the project is continued beyond five years, would continually increase its expertise, its applicability, and impact on LDC marketing systems for roots, tubers, fruits, and vegetables through a continuous systematic analysis of its own experiences and a continuous analysis of technical, empirical, and/or business developments in the perishables' field. This five-year project will provide general consultative and technical services to missions relating to the following aspects of roots, tubers, vegetables, and fruits (Hort Crops) marketing:

1. Analysis of, and methods to reduce postharvest losses in perishable Hort Crops.
2. Prefeasibility analysis for new or improved storage, handling, and/or processing facilities.
3. Recommendations for or prefeasibility analysis of potential changes in local, regional, national, or international marketing systems.
4. General assistance in agribusiness development.
5. Analysis of policy alternatives affecting the marketing system.

6. Training for LDC personnel to more effectively analyze and handle problems in Hort Crops marketing.
7. Analysis of host LDC government institutional arrangements (Government organizations, structure, and management) for dealing with Hort Crops marketing and recommendations for changes.

PART II. - Background and Detailed Description

A. Background Summary

Roots, tubers, vegetables, and fruits (which will all be covered in this project by the term Hort Crops) are very significant in the diets of the LDCs, probably ranking just under grains in their importance. Relatively, however, Hort Crops marketing systems have received little attention compared to grains from A.I.D. and other bilateral or multinational aid programs. Problems in dealing with marketing systems for Hort Crops in the LDCs are large: first, there are perhaps 75 to 100 different crops or products most of which have uniquely different marketing problems; second, the products are usually quite perishable requiring either rapid handling or good storage to reduce physiological losses or conversion by processing the products into more stable forms. However, the rewards in this area can also be large. Currently, postharvest food losses of Hort Crops are probably from 20 to 25 percent of the harvested crop, the current marketing systems are often antiquated and inefficient, and there has been little agribusiness development in modern methods of handling, storing, processing, and marketing of

these products and the opportunity for regional specialization for regional, national, or international markets has been little explored in most LDCs. While A.I.D. has provided technical assistance to some LDCs on specialized marketing problems dealing with particular Hort Crops or potentials, there has been no centralized or organized source of expertise developed by A.I.D. in this area to provide missions or LDCs with technical services on a continuing basis.

This general background summary will now be expanded to give more specific detail. The details are necessary to understand the scope of the problem and necessary to the design and qualifications of a General Technical Services (GTS) team to alleviate the problems.

B. Detailed Description

1. Current importance of Vegetable and Fruit Products (Hort Crops) in the LDCs.

(a) Physical Volume and Importance in Diets

Roots and tubers, vegetables, and fruit products (which are grouped together for the purposes of this project as Hort Crops) provide the basic diet for from 400 to 500 million people in the LDCs. Total production of vegetables, including roots and tubers, and fruit crops in the LDCs in 1975 was around 400 million tons compared to total cereal production of around 420 million tons. These perishable products provide on the average around 17 percent as many calories as do the cereal crops; however, Hort Crops provide a much more important

role in the diet than a source of calories. Many essential vitamins and minerals are provided only through vegetable and fruit products.

In many areas Hort Crops are the most important source of calories. In Zaire, Ghana, Mozambique, Tanzania, Angola, and Uganda, Hort Crops provide more calories than the cereals and Hort Crops provide more than one-third as many calories as cereals in Kenya, Nigeria, Dominican Republic, Haiti, Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Venezuela, Barbados, and Jamaica.

(b) Economic Value of Hort Crops in the LDCs

Often Hort Crops production, because it may consist of 75 to 100 kinds of products, each in themselves not representing any immense value, are often considered to be a small industry. However, the farm value of Hort Crops products in the LDCs is estimated to be from 10 to 12 billion dollars a year (this does not include value of production of home gardens for home consumption). In many developed countries the value of consumption of vegetables and fruit products exceeds that of the cereal industries. In the U. S. for domestic consumption the combined value of sales of fresh and processed vegetables and fruits greatly exceeds the value of sales for domestic

human consumption of all grain mill products. As income levels rise in the LDCs, consumption of vegetable and fruit products will undoubtedly increase.

2. Postharvest Food Losses of Hort Crops are High and Marketing Systems Inefficient.

(a) Estimates of Postharvest Food Losses in Hort Crops.

The National Academy of Sciences (NAS) suggests postharvest food losses of roots and tubers to be around 20 to 25 percent of production and estimates of losses of more perishable vegetable and fruit crops to be significantly higher. Cereal grain postharvest food losses are considered to be closer to the 10 to 15 percent range. Assuming that Hort Crops postharvest losses are normally twice that of the grains, then total losses on Hort Crops in the LDCs could be from 80 million to 120 million tons per year, while grain losses would be from 43 to 63 million tons. In terms of calorie losses only, Hort Crops losses would be around 34 percent as great as the losses in cereals. The economic value of the losses in perishables is extremely difficult to define, but probably is from 2 to 3 billion dollars per year.

(b) Marketing System for Hort Crops Inefficient and Under Stress.

Domestic supplies of Hort Crops entering commercial marketing channels (as compared to subsistence production and consumption)

because of increasing urbanization and increasing incomes, has increased several times as rapidly as population growth in the LDCs. Because of perishability and seasonality, the marketing systems for Hort Crops are typically more costly and more complex than for a system to handle equivalent quantities of grain. Further as urbanization and size of cities increase, supplies of Hort Crops must be produced further and further from market placing additional strain on transportation and marketing systems.

3. Potential for Agribusiness Development and Regional Specialization for Regional, National, or International Markets Have Not Been Systematically Explored.

Production, storage, processing, and distribution of Hort Crops is typically a highly labor-intensive process. Development of agribusiness industries involving these industries combined with regional specialization for regional, national, and international marketing of products would offer excellent opportunities for development in many LDCs. Yet the opportunities for such development have been little explored by bilateral or multilateral development agencies. Efforts in this area have largely been left to multinationals, or to sales efforts of equipment manufacturing firms, i.e., efforts have been left to "free market" systems. Just as agricultural farm production is too important to be left for development by commercial seed, fertilizer,

pesticide, or chemical companies and commercial equipment manufacturers, the development of Hort Crop industries is too important to be left to multinational food firms or to equipment manufacturers. There needs to be an organized, systematized, unbiased approach to the exploration of potentials for development and commercialization of this important segment of the agricultural industries, and the expertise developed through experience in dealing with these problems should accumulate in A.I.D.'s organizational structure to be available for use in the future. While there have been several USAID projects which have dealt with a specific Hort Crop in a specific country, efforts over time have not been organizationally connected and the expertise developed through the studies have not accumulated in A.I.D. but are typically dispersed to different commercial consultants.

4. Governmental policy alternatives and institutional arrangement alternatives for dealing with economic, marketing, and agribusiness aspects of Hort Crops marketing have been little investigated.

Governmental policies of various incentives or disincentives to business including taxes (import, export income, property taxes), price or price supports or ceilings, regulatory activities including grades and standards, infrastructure developments (credit, banking, communication, transportation,

research, and development institutions, etc.) regarding an appropriate mix to encourage and enhance Hort Crops development has been little explored. Similarly, institutional arrangements within governments to reduce food losses and enhance efficiency in and development of the Hort Crops industries has also been little explored either in absolute terms or relative to the efforts in the development of the grain industries.

5. Little organized training has been offered to LDCs to develop technical and economic expertise to handle Hort Crops marketing.

   For many years several bilateral and multilateral aid institutions have offered extensive training to LDCs in the postharvest and marketing aspects of grain, both in technical and economic aspects. A.I.D., FAO, and TPI (Tropical Products Institute, London, England) offer short courses and intensive training both in Agency headquartered countries or in the LDCs. But training in Hort Crops marketing has been extremely limited and mostly on a sporatic basis for a few individuals where there was a specifically identified specialized problem. As Hort Crops probably rank just below grain in value and consumption, organized training to reduce food losses and increase marketing efficiency in this important field should also be implemented.

6. Special problems dealing with Hort Crops.

   Many vegetable and fruit crops are highly perishable; the length

of usable life after harvest may vary from one to two days for some berries harvested at a mature stage, to several months for potatoes, apples and citrus stored and handled under optimum conditions. In trade terms, most vegetable and fruit products are termed "perishables" while some individual items such as potatoes, onions, apples, and citrus may be classified as "semiperishables". Perishability is an integral consideration in the design and development of handling systems for vegetable and fruit products. Additionally, seasonality of production even in many semitropical or tropical areas because of wet and dry seasons may be nearly as extreme as in temperate zones where seasonality is caused by temperature changes. Because of both seasonality and perishability, typical markets for most individual products are characterized by seasonal gluts or shortages. These factors plus inelastic demand for many products result in a wide price variation both within each season and between seasons for any given commodity.

The variety of products, the seasonality, perishability, and price variability make analysis of perishables more difficult than for grains, but do not diminish the importance of programs of loss reduction and programs to increase marketing efficiency of the perishable crops industries.

Combined with seasonality, perishability, price variability, there is still another major marketing problem for vegetables and fruits. While we are classifying vegetables, including roots, tubers, and other vegetables and fruits (both tropical and decidious) together in one classification, Hort Crops, in actuality we are dealing with perhaps 100 separate commercial vegetable and fruit products. The storage, handling, technical aspects of processing, processing equipment, containers, packaging, marketing channels, etc., of individual products have widely varying requirements.

Because of these characteristics of Hort Crops, the organizational unit giving technical assistance must have access to a wide range of technical and economic expertise. As will be shown later, the GTS team unit is organized to be able to provide this necessary wide-range of expertise.

7. National Academy of Sciences' report indicates reducing losses in perishables as high priority.

The National Academy of Sciences' draft report of their analysis for A.I.D. of the extent of postharvest food losses in the LDCs and appropriate methods of intervention ranks roots and tubers and fruits and vegetables as high priority areas for reduction of food losses. The NAS final draft stage report states:

"specific commodity research priorities include:

roots and tubers - determination of optimum storage

temperature, humidity, and ventilation for different varieties. Fruits and vegetables - improved low-cost packaging, damage control, low-cost controlled environmental storage (waxing, polyethylene sheeting, etc.)."

The GTS project proposed here would cover both the technical as well as the economic aspects of roots and tubers and fruits and vegetables marketing and would include some limited adaptive research.

PART III - Goals and Purposes

A. Goals

To increase the availability of Hort Crops and enhance the basic diets of people in the LDCs by reducing postharvest food losses, to reduce costs of Hort Crops in LDCs by improving market efficiency, and to enhance development of the Hort Crops industries.

B. Purposes

The purposes of this project are (1) to establish an institutional base and technical services teams for identification of and reduction of problems in Hort Crops storage, marketing, and processing, and (2) to design projects or activities which will reduce food losses, reduce costs and improving market efficiency, and/or encourage and enhance economic development through agribusiness development in the labor intensive Hort Crop industries and through possible foreign exchange earnings of exports.

PART IV - Methods and Procedures to Obtain Goals and Purposes

A. Introduction

The basic goals are to increase the quantity of food available to consumers either in fresh or processed form and to reduce the cost of food to consumers. Additional objectives are to enhance development through agribusiness development, and through potential earnings of foreign exchange from exports. To obtain these objectives, the governmental policies and institutional framework in the LDCs may need basic revisions. Further, training of host country personnel in both the technical and economic aspects of Hort marketing will be necessary.

To obtain the objectives, an institutional base will be established and a GTS team will be organized to provide technical assistance to mission and host governments. The background information has provided much detail concerning the characteristics needed in such a team. However, the necessary qualifications and organizational structure of such a unit will now be given in detail. This will be followed by a description of the technical services the team will provide.

B. The General Technical Services Team

Since varying technical and economic or marketing competencies may be necessary under a wide variety of problems and wide variety of Hort Crops, the GTS team must encompass or have access to a wide range of personnel. It is proposed that a relatively small core leadership team be developed through a contractor and that this core staff have access to a broad variety of technical and economic personnel

either from commercial Hort Crops marketing firms, personnel from consulting firms, or from colleges and universities.

Further, a PASA would be developed with the USDA for assistance by appropriate food technologists, food engineers, plant physiologists, and economic and/or marketing specialists. The core team would consist of economists or marketing specialists, food engineers, and food technologists with a broad range of capabilities in Hort Crop marketing. Assistance in specialized problems would come from consultants at universities, private firms, or under the PASA with the USDA.

C. The GTS Team Functions, Methods, and Objectives

The GTS team will have the competency and will cover the following aspects of Hort Crops marketing on requests from LDC governments through the A.I.D. missions.

1. To Lengthen Life of Hort Crops and Reduce Losses in Fresh Form

Technical team assistance here would be in the most appropriate methods of storage and handling of the perishables including: storage design, investigation of appropriate low cost cooling or refrigeration systems, sprays, waxes, chemical treatment, etc., to increase storage life or life in the marketing systems, appropriate packages or containers and appropriate transportation methods should also be covered. In any approach, both the technological as well as economic aspects of reducing losses or increasing marketing efficiency should be considered.

While major losses in grains are primarily due to insect damage in storage, major losses in perishables are primarily due to physiological aging of the perishables, so major efforts would be to slow or retard the life processes of the perishables once they have been harvested.

In addition to lengthening the life of the fresh perishable product, an alternative is to increase the speed and efficiency of the flow of the products from the producer to the consumer. This aspect will be covered under a subsequent section "Increasing the Efficiency of the Marketing System."

Still another alternative is to convert the fresh perishable products into more stable processed forms. A discussion of this possibility follows.

2. To Analyze the Potential for Processing of Perishables into Acceptable Stable Forms

Processing of perishables is often considered an added expense; e.g., if fresh products are processed, there is an added cost, therefore the conclusion is often drawn that, in general, processing of perishables is an inappropriate technology for the LDCs. However, both the premise and the conclusion are undoubtedly incorrect under many circumstances. Perishables may be processed for several, and often simultaneous objectives: (1) for preservation, (2) for cost reduction, and (3) for quality control and convenience. Let's

explore these objectives briefly. Preservation: Various basic forms of preservation have been utilized since the dawn of civilization to convert seasonal perishable products to relatively stable forms. Smoking and drying of meats and fish, fermentation of juices to wine, milk to cheese, brining of olives, etc., were utilized to preserve perishables. By far the major production of manioca (Cassava) in Brazil historically has been dried. In a broad historical perspective, canning, and freezing are rather modern preservation technologies. Much food processing in developed countries was originally for preserving seasonally produced products for use during the winter months. Many relatively new technologies; i.e., concentration of juices, several new drying technologies and some canning and freezing operations may be adaptable to some situations in the LDCs. Season variations in rainfall in many semitropical or tropical climates may affect seasonal production almost as much as temperature variations in temperate climates. Cost Reduction: The systems under which many perishables are processed may actually reduce final costs to consumers compared to costs of marketing fresh unprocessed counterparts. There are several reasons for this and not all may necessarily apply to any specific product. (a) Products may be processed during times of seasonal gluts when raw product prices are low, then sold in processed forms during off seasons when fresh unprocessed product costs are high. (b) Off-grade products which may be discounted in fresh markets because of blemishes, misshapen products, minor

defects, etc., may be perfectly acceptable for certain forms of processing - for example, fruit juice production. (c) The products may be processed in low cost production areas some distance from markets. Fresh market production could be unfeasible in these areas because of perishability of fresh products and the time and distance to markets. (d) Reduction in weight and/or volume by some processing technologies (as well as the reduction in perishability) may reduce packaging and distribution costs. For example, the equivalent of 100 pounds of fresh potatoes, yams, or cassava in processed dehydrated form could be packaged in a gallon milk carton with a total weight of around nine pounds. (e) Because of the stability of the processed products, the geographical area in which the products may be marketed is expanded. This may lead to specialization in production areas (with inherent cost reduction) and economies of scale in marketing facilities (which also may inherently reduce costs). Quality Control and Convenience: Both of these factors undoubtedly are more important in developed countries than in the LDCs, but do have relevance in the LDCs. Because of specialization and economies of scale in processing, stricter quality control may be obtained when food is centrally processed compared to individual home preparation. Domestic production of fruit juices for markets in Brazil or India (India has recently established a commercial apple juice processing facility), would be examples. Blending of manioca (cassava flour) with wheat flour for commercial breadmaking is another example. Quality control and/or convenience may be of critical importance if international marketing is considered.

3. To Increase the Efficiency of the Marketing Systems

As indicated previously, the marketing systems for Hort Crops in many LDCs are often inadequate and inefficient and the systems have not kept pace with rapid urbanization. Assembly, grading, packaging, transportation systems, central market facilities, and the wholesaling and retailing functions may need considerable modernization to efficiently handle the increasing quantities of perishable produce.

In most cases, a system analysis may be needed of the complete marketing system before the most critical roadblocks for an efficient system can be discovered. Prefeasibility economic-engineering analysis will be used to isolate critical elements in the system. The prefeasibility analysis should lead to recommendations for changes in storage, handling, and/or processing facilities.

4. To Assess the Potential for Changes in storage, handling, and/or processing facilities.

Many LDC countries have a wide range of soils and microclimates. Many areas highly suitable for production of Hort Crops have not been exploited because of marketing limitations. With increased life of perishables and/or conversion into more stable processed forms, the economics of production of Hort Crops in these areas may be greatly enhanced. The reduction in perishability may greatly

increase the marketing areas which can be served from production of Hort Crops in the most favorable production areas (most favorable because of climate and soils). A specific example may serve to illustrate this phenomenon: In the apple producing areas of India the low grade fruit, because of misshapen fruit, off colors, blemishes, etc., was not of enough value to ship in fresh form to markets some distance from the production area. It was sold locally at significant price discounts or was wasted. However, by the establishment of an apple juice factory, the low grade fruit was converted to a stable nonperishable form. The apple juice is sold over a much larger geographical area than the off-grade fresh fruit could be sold.

There appears to be an excellent opportunity for many LDCs to provide vegetable and fruit products to developed market economies. Both production and processing of Hort Crops is typically high labor intensive. Further, stringent soil, water, and micro-climate requirements limit areas for production of these products in many developed countries and has resulted in high land costs of suitable production areas. The combination of labor and land costs in developed countries has created a significant opportunity for production of Hort Crops in the LDCs both for fresh market products and their processed forms.[1/] Many specific examples can be used

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1/ See M. Mackintosh. "Fruit and Vegetables as an International Commodity - The Relocation of Horticultural Production and Its Implications for Producers" Food Policy Volume 2, No. 4, 1977.

to demonstrate this apparently fairly general phenomenon: The Mexican fruit and vegetable industries supplying the U.S. market, the shift of pineapple production from Hawaii to the Philippines and Kenya, the supply of fresh fruits and vegetables and some processed forms from Northern Africa (also from Kenya and Senegal) to European markets, mushroom and asparagus production in Taiwan for world markets and Thailand and Brazil shipping manioca (cassava) chips to Europe for cattle feed. While each of these examples is relatively modest in itself, combined the production represents a significant contribution to foreign exchange in the exporting countries, and, future opportunities are probably limited only by entrepreneurial capacity (including LDC governmental knowledge and ability) to discover and react to opportunities.

5. To Provide General Assistance in Agribusiness Development

The efficiency of marketing systems, feasibility analysis of storage, handling, and/or processing facilities, regional, national, and international market expansion, governmental policies of incentives or disincentives to business, etc., are all related to agribusiness development, but at the governmental or policy level rather than at specific firm levels. It is intended that the technical assistance team would primarily assist host governments at the governmental policy level. However, if host governments asked for a prefeasibility study for a specifically proposed agribusiness enterprise or an independent unbiased analysis of feasibility

studies for a particular enterprise done by others, the team would accommodate the mission and host government to the extent possible.

The team would lend its expertise to any legitimate agribusiness problem whether dealing at the governmental or firm level, if assistance was requested by the host government through the mission.

6. To Provide Policy Analysis and/or Policy Recommendations to Missions and/or Governments in the Area of Hort Crop Marketing

This can include a wide range of consultation or analysis of policy issues relating to the success of any marketing system: Financing of facilities, structural arrangements of the industry - government versus private versus cooperative ownership and management, vertical integration arrangements - e.g., contract farming and farmer - processor or farmer - marketer arrangements, price intervention and/or controls, market intelligence options, import and export restrictions and/or subsidies, credit, banking and financial institution services, supply, and cost of necessary (perhaps governmental) services, e.g., electricity, fuel, water, sewage and waste disposal, police and fire protection, communication facilities, grades and standards, inspection and certification, supporting infrastructure for agricultural production - seed, fertilizer, equipment availability, agricultural extension services, etc.

7. To Assist Governments in Developing Institutional Structures to Facilitate Development of Efficient Hort Crops Marketing Systems

In many LDCs, the availability of capable personnel in governmental administrative positions will be so thin, and experience in marketing systems so limited, that assistance in developing appropriate administrative organization and administrative personnel will be necessary before effective marketing systems can be developed. The GTS Team, will, when necessary and desirable analyze current institutional structures in host governments and recommend changes for more effective development of efficient marketing systems.

8. To Provide Training for Host Country Personnel

Training will be provided for host country personnel, both in the technical and economic aspects of postharvest loss reduction and in Hort Crop marketing systems. This can involve training at both the undergraduate and graduate level in various aspects of engineering, plant physiology, food technology, economics and marketing.

Short courses will be taught both in the USA and in host LDCs to offer generalized training for LDC personnel.

9. To Plan, Program, and Conduct Adaptive Technical and Economic Research

While the principal objective of the GTS Team is to assist missions and/or host governments, certainly not all of the team's time will

be spent directly in the LDCs. The GTS Team organization will consist of a small, four to five man team of professionals with a significant backstop of consultant or USDA PASA expertise. The consultant or USDA PASA experts will be used for specialized problems directly related to mission or host government requests. The nature of many specialized LDC problems may be such that it will require an on-site review and problem definition, a brief review and analysis at the team center (in the U.S.) followed by a revisit to the LDC to present recommendations. Probably only 20-30 percent of the time of the core team will be spent directly in missions and probably around 35-45 percent of the consultant or expert's time will be spent directly on TDYs in the missions.

An integral function of the GTS Team when not involved in travel status would be planning, programming and adaptive technical and economic research. When not on TDY, the technical service team would perform the following functions:

(a) Conduct adaptive research on specific mission problems. This can be either adaptive technical or economic research, such as analysis, consultations with experts, literature reviews, visits to firms or agencies who are doing related work on the specific problem, etc.

(b) Review world literature and communicate with research and extension workers (worldwide) to assess the economics and technology of appropriate means of reducing losses and increasing marketing efficiency.

(c) Plan specific short term training courses to be held in the United States or in the LDCs.

(d) Schedule field trips and part time specialized training for particular LDC personnel interested in specialized areas of perishable loss reduction.

(e) Develop manuals and/or recommendations for storage, handling, processing, packaging, and marketing of particular crops or commodities.

(f) Supervise the training of LDC full time undergraduate and/or graduate students in storage, handling, processing, packaging, and marketing of perishable crops.

(g) Collaborate and/or cooperate with other bilateral or multinational development agencies and/or multinational financial institutions interested in the same areas.

(h) Plan and conduct seminars and workshops involving LDC and DC experts in the postharvest loss reduction field.

D. Expected Products (Results) of the Project

Mission requests for assistance may cover a wide range of technical or economic aspects of reducing Hort Crops postharvest food losses, or increasing marketing efficiency, or in market expansion of Hort Crop industries. The time and effort in any given LDC or mission will depend on the complexity

of the problem. The following are expected to be minimum products or outputs of the GTS Team on Horticulture problems during the five-year period of the contract:

1. Twenty-thirty missions or host LDC governments given major assistance on major programs dealing with Hort Crops postharvest losses or market efficiency or market expansion.

2. Twenty-thirty technical reports written (one for each mission assisted).

3. Four short courses taught. Over 100 trainees trained.

4. Eight international meetings organized to collaborate or cooperate with major donor countries.

5. Fifteen LDC graduate students trained at the M.S. or Ph.D. levels.

6. Fifteen specialized training programs organized or LDC individuals or groups on specific programmatic areas.

7. Five bulletins or publications produced on Hort Crops industries in the LDCs and their long run potentials.

8. Five training manuals or teaching guides developed for LDC use.

PART V - Project Analysis

A. Economic Analysis

Roots and tubers, fruits and vegetables (all classified together as Hort Crops) represent a $10 to $12 billion value at the farm level in the LDCs.

The value at the consumer level is probably over $25 billion. Hort Crops are probably second only to grain products in value and quantities consumed by people of the LDCs. Postharvest food losses are estimated to be over 20 percent of the harvested crops. Marketing systems are inefficient and have not kept pace with rapid urbanization. Potentials exist for regional production of Hort Crops in several LDCs to serve regional, national, and international markets. Commercialization of these Hort Crop industries, as they are typically labor intensive industries, would offer job opportunities for many; international marketing opportunities may be large for certain LDCs. Despite these problems and opportunities, rather little has been done by A.I.D. or other major donors to reduce losses, increase efficiency, and assess market expansion opportunities for these important Hort Crops. One aspect alone, reducing postharvest food losses by 50 percent, a stated goal of the U.N. General Assembly, would result in savings by the LDCs of over one billion dollars per year. Potentials for increasing marketing efficiency, increasing agribusiness development, and increasing market expansions would also be of considerable value to the LDCs globally. The development of a GTS Team to assist mission and host governments in problems dealing with Hort Crops marketing appears in perspective to be a very small investment.

B. The Financial Plan

The proposal provides for five-year funding for the GTS team. No personnel will be stationed outside of the U.S., although considerable travel will be necessary.

Project costs to be borne by A.I.D. are estimated to be $2,250,000 for the five-year period. The project will initially be funded in FY 1979 for the first two years.

Year	Required Amount ($000s)	Obligations ($000s)	
1 FY'79	$ 100	FY'79	($600)
2 FY'80	500		
3 FY'81	500	FY'81	($500)
4 FY'82	500	FY'82	($550)
5 FY'83	600	FY'83	($600)
TOTAL	2,250		$2,250

The detailed budget appears in Annex A.

Essentially, the proposed project funding would create a small core team with the primary contractor and then consulting or USDA PASAs will be developed to support the core team. This is envisioned as follows:

Core Team

Leader (senior marketing economist)	12 mm/year
Asst. Leader (Senior Agricultural Engineer)	9 mm/year
Asst. Leader (Senior Food Technologist	9 mm/year
Two Technicians or Graduate Students	24 mm/year
One Secretary	12 mm/year

Additionally, funding would be available to hire short-time specialists or consultants from private business firms or from colleges and universities.

Consultants to Core Team

Consultants (Economists, Food Technologists, Engineers, Plant Physiologists)	24 mm/year
Specialized contract reports	5 mm/year

USDA PASA

Economist or Marketing Specialist	4 mm/year
Food Technologists, Engineers, Plant Physiologists	4 mm/year
Totals (Professionals)	67 mm/year
Technicians or Graduate Students	24 mm/year
Secretary	12 mm/year

C. Social Analysis

The initial beneficiaries of these projects are those institutions and agencies of LDC governments who plan and implement projects to reduce postharvest food losses, increase marketing efficiency, and encourage agribusiness development and market expansion for Hort Crop products. The ultimate beneficiaries are farm producers and both farm and urban consumers as more food will be made available at lesser costs. In many aspects, i.e., commercialization of the agribusiness enterprises, for example food processing, and expansion, and/or development of international trade, employment opportunities will increase as most of these

enterprises are highly labor intensive and the country could also benefit from increased foreign exchange earnings.

In many LDCs, women perform most of the production and marketing functions in the Hort Crop industries. This project offers a sound example where women will specifically gain employment and develop their capacities for management and marketing skill as these enterprises develop in the LDCs.

D. Technical Analysis

The basic technical competencies for dealing with Hort Crop marketing in the LDCs undoubtedly lie within the U.S. technical community. Physiology, food storage and process engineering, marketing and engineering work done in the U.S. are relevant to many of the Hort Crop industries in the LDCs. Some adaptive research will, of course, have to be conducted, but the basic principles will apply. The research and development work in this area in the U.S. is overwhelming when compared to work in Western Europe, developed countries, or in the developing countries. U.S. capabilities are excellent and the project is designed to call upon experts in universities, private businesses, or the USDA as the need may arise.

E. Relation to Other Projects and to Existing Knowledge

A.I.D. has had various activities in reducing postharvest food losses in roots and tubers and vegetables and fruit marketing, but these activities have been sporadic, not coordinated, and expertise has not been built or

developed in a central source or single institution to handle mission requests, or to expand work in this area.

Some of the CGIAR institutions, notably (1) the International Potato Center (CIP), (2) the International Institute of Tropical Agriculture (IITA), and (3) the International Center for Tropical Agriculture (CIAT) do crop production work on roots, tubers, and vegetables and fruit; similarly, the Asian Vegetable Research and Development Center (AVRDC) also does work in this area. However, AVRDC activity has been solely on production work while CIP, IITA, and CIAT have done some limited work on storage, handling, and processing.

Tropical Products Institute, London (TPI), Institute for Agronomic Research in the Tropics, France (IRAT), and FAO have done some production research and some limited technical investigations on storage and handling for Hort Crops in tropical areas. However, the principal technical backstop will be from work conducted in the United States. A search of the Computerized Research and Information System (CRIS) of the USDA yielded over 150 active research projects being conducted by colleges, universities, or the USDA on storage handling, marketing, and processing of vegetable and fruit products.

The National Academy of Sciences, in its report on Postharvest Food Losses in Developing Countries, recommended that an organization dealing with information exchange, collaboration, and coordination between major international aid donors be created to increase the effectiveness of total donor programs in the area of Hort Crop marketing assistance to

the LDCs. This would be similar to GASGA (Group for Assistance in Systems Relating to Grain after Harvest) set up to deal with grain storage and marketing problems. GASGA currently represents the scientific efforts of eight major donors in the area grain handling problems. It is expected that the core team leader of this GTS project would assist in creating and developing such an international donor group to deal with Hort Crop marketing problems.

F. Initial Environmental Examination

The activities of this project fall into the area described in environmental procedural regulations 216.2(c) "Analysis, Studies, Academic or Investigative Research, Workshops, and Meetings". These classes of activities will not normally require the filing of an Environmental Impact Statement or the preparation of an Environmental Assessment. This project itself only proposes the development of recommendations and/or reports to missions and/or host governments. However, if and when recommendations are implemented by the mission or host governments. However, if and when recommendations are implemented by the mission or host government, such an assessment of environmental impact may be necessary. As the initial outputs from this project are only recommendations, guidelines, or plans, this project clearly qualifies for a negative determination.

VI Scope of Work:

Goal and Objective:

To provide assistance in reducing postharvest food losses, in in reducing marketing costs and improving marketing efficiency, and in enhancing the development of the vegetables, fruits, roots and tubers (Hort Crops) industries in the LDCs.

Description of Work

This project will provide technical assistance and services to the AID Bureaus and Missions and the LDCs in the area of reducing postharvest food losses, improving marketing efficiency and enhancing development of the Hort Crop industries in the LDCs. The project will provide the technical services from a core team with extensive expertise in storage, handling, marketing, processing and agribusiness development of the Hort Crop industries, and will enable the core team to contract for specialized services of outside counsultants or experts from commerical, university, or governmental sources. The type and scope of services to be provided by the contractor and related activities will include the following:

1. In-Country Service to AID Bureaus and Missions: The contractor will respond to Bureau and Mission requests for specific in-country services. The period of in-country consulting services will be limited to 30 man days of consultant/specialist services per request in any calendar year unless a longer period is specifically justified and authorized by DS/AGR.

For any services to a particular Mission requiring more than 30 man days in a calendar year, either the Mission or Bureau will fund the additional travel, per diem and/or travel expenses of the consultant/ specialists. The purposes of the in-country visits will generally be:

(a) Thoroughly review with Mission/LDC and other concerned personnel the on-going or planned projects to reduce losses, increase marketing efficiency or enhance developmental efforts in the Hort Crops industries, with which the services of the technical team should be integrated.

(b) To make on-site analysis of the status and needs relating to Hort Crops marketing systems.

(c) To collect technical, climatic, and economic data and information current and proposed institutional arrangements to formulate recommendations.

(d) To provide technical services of the contractor and consultants/ experts including, but not necessarily limited to the following types of Mission/LDC assistance.

1. To lengthen the life and reduce postharvest losses of Hort Crops in fresh forms.

2. To analyze the potential for processing of perishables into stable forms.

3. To reduce marketing costs and increase marketing efficiency of Hort Crops.

4. To assess potentials for market expansion (either in local, regional, national, or international markets.)

5. To provide general assistance in agribusiness development.

6. To provide marketing policy alternatives

7. To assist governments in developing appropriate institutional structures.

8. To provide in-country training for host country personnel

9. To plan, program, and conduct adaptive technical and economic research.

(e) To prepare comprehensive written reports on requested areas of consultancies. The completed reports and other documents prepared will be transmitted to the Mission through the pertinent bureaus, or direct as specified by the Mission and Bureau.

2. Training Programs:

Plan and expedite training programs of varying intensity, depth and duration with emphasis on the technical, economic and managerial phases of the Hort Crops industries. Training programs will be in-country, regional, or in the U.S. and range from on-the-job training for workers to graduate degrees programs in specialized areas. Different levels of training should include: (a) specific short term in-country training courses for LDC personnel. (b) Field trips in the U.S. and specialized short term training in the U.S. for LDC personnel. (c) Formal training at the undergraduate and graduate levels in U.S. institutions. (4) Workshops or seminars involving LDC and developing country experts in marketing of Hort Crops.

3. Information Services: Collect and maintain references and informational

materials on the technical, economic, managerial and agribusiness aspects of Hort crops with particular emphasis on postharvest losses, economic efficiency and comparative and locational advantages, for distribution on request to personnel and agencies in the LDCs, the Bureaus, Missions and AID contractors, and other international technical assistance and lending agencies and institutions.

Since informational materials are extensive and widely scattered through various U.S. and other institutions it is not expected that the contractor will maintain a complete file of all possible source material. However, the contractor should develop systems of search and retrival from the widely scattered sources of expertise on a variety of technical and economic areas dealing with postharvest handling of Hort Crops. The contractor should continuously review world literature on the subject. In addition the contractor will develop new or revised informational/reference articles on timely subjects related to Hort Crops marketing and distribute them to LDC and AID personnel.

4. Adaptative Research on Specific Mission or Regional Problems:
A significant effort may be spent in reviewing literature on specialized problems and in obtaining and analyzing relevent economic variables before initial substantive recommendations may be made concerning particular Mission/LDC problems. In many cases short term adaptive technical and economic research will be conducted on specialized problems. Because of the wide range of technical and economic problems affect the postharvest

handling and marketing of Hort Crops, adaptive technical and economic research should be done only on problems of either great economic importance of on broad interest to several Missions.

5. Reports:

a. The contractor will submit a complete activity report to DS/AGR, the pertinent Bureau and the requesting mission on each consultation visit, training course or workshop, or other specific services/assistance requested within 60 days after return to the contractors location. Interim summary reports will be provided sooner- even prior to departure from the LDC, when necessary and requested.

b. Annual Reports - within 60 days after completion of each 12 month budget period - 40 copies to be provided to AID/Washington - other copies to be distributed to International Agricultural Research Centers and relevant researchers world-wide.

c. Other publications will be used to disseminate information as deemed appropriate by the contractor and/or the AID project officer.

d. The contractor shall submit three copies of all reports listed as being a product of the contract (administrative, progress, final, and technical reports, etc.) to the Documentation Coordinator, DS/DIU Agency for International Development, Washington, D.C. 20523, or his designee. Such reports shall include a title page showing the title of the report, project title as set forth in this contract and the

contract number. One copy of each report shall be clearly typed or printed on white paper so that it may be photographed to produce a microfilm master. Technical reports shall be accompanied by an author-prepared abstract.

PART VII - Implementation Arrangements

A. Analysis of the Administrative Arrangements

1. Contractor - It is essential that the contractor have considerable knowledge, experience, and a disciplinary background in root, tuber, vegetable, and fruit (Hort Crop) marketing, since the need is to transfer current knowledge and expertise for use within the development community. The nature of the project is to critically assess conditions in LDCs and to be able to determine existing technologies and analysis that would be transferable, and to be able to see what is beneficial and transferable. This judgment requires an experienced background which can only come from experience in Hort Crop technology and marketing in the U.S. and in LDCs. The contractor should be located in an area which has a substantial Hort Crops industry, or has had considerable experience in one of these areas.

Following are contractor attributes that are essential to project success:

(a) The contractor must show evidence that Hort Crops marketing is and has been an important element of his portfolio.

(b) The contractor must have at least three full time employees who are trained in some facet of the economic or technical aspects of Hort Crops.

(c) The technical project manager must devote at least seventy-five percent of his time solely to this project.

(d) The technical project leader must have had at least one and one-half years LDC experience working in Hort Crops marketing or a closely related field. The project cannot afford to have this experience gained through conduct of the project.

(e) There must be readily available to the contractor (preferably at the contractor's location or in the employ of the contractor), consultants or preferably part time experienced personnel from within the disciplines of agricultural engineering (food storage or process engineering), food technology, plant physiology, rural sociology, and extension methods.

(f) It is desirable that the contractor have available expertise in the languages of Spanish and French in order to translate published materials to these languages.

2. LDC Institutions - Most project output will be produced in direct cooperation with LDC institutions. LDC institutional cooperation will be needed in nearly all aspects of technical assistance to host countries. USAID's will assist in enlisting cooperation and participation of host country institutions through the missions. It is envisioned that most of the GTS team activity would result through requests of an LDC government institution through the mission to the team.

3. A.I.D. - The Project Manager in DS/AGR will need to be heavily involved with this project. It is anticipated that the food marketing specialist will spend at least eighty work days annually on the project. This is necessary in order that the contractor has A.I.D.'s specific assistance with linkages and planning. A.I.D. must play a key role in providing these as the contractor will not be able to secure this assistance from any other source. The A.I.D. project manager will necessarily use all the formal and informal technical aids within A.I.D. to assist him with detailed planning, coordinating work with regional bureaus and missions, and assistance in problem analysis and review of individual project activities.

B. Implementation Plan

AID/W is the proposed procurement agent for this fully competitive negotiated contract. The anticipated procurement schedule is as follows:

1.	Project Paper Review and Approval	May 1979
2.	PIO/T to CM/COD	June 1979
3.	Issuing date - RFP	July 1979
4.	Closing date - proposals	August 1979
5.	Technical evaluation of proposals	September 1979
6.	Contract awarded	September 1979
7.	Initiation of work	October 1979

C. Evaluation Plan

The project will be managed by the Agribusiness Development Division in DS/AGR. An AID/W Coordinating Committee (Regional Bureaus and DSB) will serve in an advisory evaluative role. The project will be closely monitored with bimonthly meetings between the project manager and the contractor.

A regular evaluation will be made annually with the contractor presenting a progress report before the Coordinating Committee. A comprehensive (team) evaluation will be made between the project's 18th and 24th months to evaluate progress, determine project impact, to suggest improvements, and to recommend future direction for the project.

ANNEX A.

BUDGET

Core Team (at a Major U. S. University)

	1979	1980	1981	1982	1983
Contractors Core Team					
A. Personnel: Team Leader (Economist), Asst. Team Leader (Food Tech/or Systems Engr.), Engineers, Marketing Specialists, Technicians Graduate Students, Secretary, etc.	$ 28,700	$148,500	$148,500	$163,350	$179,600
Fringe Benefits (15%)	4,450	22,275	22,275	24,500	26,940
Overhead (50%)	14,850	74,250	74,250	81,685	89,800
	$ 49,000	$245,025	$245,025	$269,535	$296,340
B. Specialized Technical Assistants and/or Specialized Reports; Consultants from Private Industry					
Consultant Time	$ 24,000	$115,000	$115,000	$126,500	$138,000
Specialized Reports	5,000	25,000	25,000	27,500	29,000
	$ 29,000	$140,000	$140,000	$154,000	$167,000
C. PASA With USDA					
Economists	$ 4,000	$ 20,000	$ 20,000	$ 22,000	$ 25,000
Engineers or Food Technologists	4,000	20,000	20,000	22,000	25,000
Personal Benefits (7½%)	600	2,700	2,700	3,300	3,750
Overhead (26%)	2,080	9,360	9,360	11,440	13,000
	$ 10,680	$ 52,060	$ 52,060	$ 58,740	$ 66,750
D. Travel, Per Diem and Expenses					
A, B, and C above	$ 8,000	$ 47,500	$ 47,500	$ 51,225	$ 55,000
E. Expendable Supplies and Equipment	$ 3,320	$ 15,450	$ 15,450	$ 16,500	$ 14,910
TOTAL	$100,000	$500,000	$500,000	$550,000	$600,000

ANNEX B.

TECHNICAL CRITERIA FOR PROPOSAL EVALUATION

1. Responsiveness and Quality of the Proposal (250)

A. Understanding the purpose of the project within A.I.D. development objectives	- 50
B. Understanding the constraints involved in working with A.I.D. and developing countries	- 30
C. Understanding the breadth of problems associated with economic and technical aspects of vegetable and fruit marketing	- 40
D. Quality of the design and approach; clarity and adequacy of detail	- 50
E. Matching of personnel to tasks	- 80

2. Organizational Capabilities (300)

A. Number of full-time professionals involved in economic and technical aspects of vegetable and fruit markets and balance among specialities and crops.	- 80
B. Experience in developing countries	- 60
C. Relevant, past or present, activities relating to project	- 70
D. Interdisciplinary team experience	- 30
E. Counterpart relations in developing countries	- 30
F. Language capability	- 30

3. Key Personnel - Qualifications and Experience (450)

A. Training in economic and technical aspects of vegetable and fruit marketing	- 70
B. Practical broad experience in vegetable and fruit marketing	- 100
C. Vegetable and fruit marketing experience with agencies in developing countries	- 160
D. Experience in interdisciplinary work	- 60
E. Experience in management of U. S. government controls	- 60

AID 1020-20 (1-72)

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 79 to FY 83
Total U.S. Funding $2,250,000
Date Prepared: 3/6/79

Project Title & Number: Storing, Processing, and Marketing of Vegetables and Fruit

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes: To increase the quantity and quality and reduce the cost of food in cooperating LDCs. To reduce postharvest food losses in roots, tubers, vegetables, and fruit crops, to increase marketing efficiency and to aid in agribusiness development of these industries.	**Measures of Goal Achievement:** Quantities and qualities of roots and tubers and fruits and vegetables available are increased. Postharvest losses reduced, markets expanded, costs reduced, and agribusiness development increased.	On site inspection in market place and laboratory tests. Records maintained by Minister of Agriculture, USAIDs, records of international trade, common knowledge of agribusiness development expansion.	**Assumptions for achieving goal targets:** LDCs give high priority in the development of the agricultural sector. That LDCs recognize the importance of food losses, marketing inefficiencies, and the potentials for marketing and agribusiness development. That USAIDs and LDCs will initiate programs to alleviate current marketing problems in roots, tubers, vegetables and fruits.
Project Purpose: To develop a technical services team which will provide, upon requests by cooperating LDCs and USAIDs, technical assistance in roots, tubers, fruits, and vegetable storage, handling, processing, marketing, and agribusiness development with the aim on reducing postharvest food losses, increasing marketing efficiency, and assisting in market and agribusiness development. The program will consist of technical assistance in planning, analysis, and training in the above areas.	**Conditions that will indicate purpose has been achieved:** End of project status. A. Reduced postharvest food losses in the marketing system. B. Economical storage, handling, processing and marketing systems developed. C. Market systems expanded, int'l. balance of trade improved. D. Agribusiness aspects developed resulting in both increased employment and increased efficiency. E. Linkages established between LDCs and contractor and other int'l. organizations to exchange technology.	For all items, see above; but also A. Rpts. and records of LDCs, USAIDs, and contractor. B. Records of Ministry of Agr., of LDC, and USAIDs, common industry knowledge. C. Records of Ministry of Trade, Commerce, or LDC. D. Records of Ministry of Commerce or Trade Census of business - common knowledge of USAIDs. E. Minutes of meetings of donor groups.	**Assumptions for achieving purpose:** In addition to above: A. That political and social climate is such that effective programs can be established to accomplish objectives. B. Farmers and merchants in marketing systems receptive to new ideas. C. That short term technical assistance will be effectively and efficiently utilized.
Outputs: A. Analysis of, and methods to reduce PHFL in roots, tubers, fruits, & vegetable crops. B. Prefeasibility analysis for new or improved storage, handling, or processing. C. Recommendations for or prefeasibility analysis of potential changes in local, regional, national, or international marketing systems. D. General assistance in governmental policies affecting agribusiness development. E. Analysis of policy alternatives affecting the marketing systems. F. Training of LDC personnel in reducing losses and increasing marketing efficiency and agribusiness development. G. Analysis of host government institutional arrangements for dealing with marketing problems associated with roots, tubers, vegetables, and fruit.	**Magnitude of Outputs:** - Unquantifiable. Depends on LDC & USAID requests,, however, suggest following is an obtainable goal. A. 20-30 USAIDs or LDCs given major assistance in reducing losses, increasing efficiency, expanding markets or agribusiness development. B. 20-30 technical rpts. written (one for each mission assissted). C. Over 100 trainees taught in 4 short courses. D. 8 int'l. mtgs. held to organize, collaborate, or cooperate with major donor countries. E. 15 graduate students trained at M.S. or Ph.D. levels. F. 15 specialized training course organized for LDC groups or individuals in specific programmatic areas. G. 5 bulletins published on root, tuber, vegetable, and fruit industries in LDCs and their long run potential. H. 5 training manuals or teaching guides prepared for LDC use.	**OUTPUTS:** A. Records of USAIDs, contractor rpts., AAG/W audits. B. Contractor reports. C. Contractor records, USAID records. D. Minutes of Mtgs. of int'l. donor technical groups. E. Records of contractor, records of USAIDs. F. REcords of contractor. G. Physical inventory of contractor rpts. H. Physical inventory of contractor rpts.	**Assumptions for achieving outputs:** A. Technical assistance will be requested as needed. B. Contractor's technical and economic expertise is adequate to handle problems. C. Necessary managers and technicians in LDCs will be made available for training. D. Other international donor groups are interested in same aspects of development. E. LDC graduate students are interested in the particular aspects of development. F. That LDCs will request intensive training on specialized technical or economic problems. G. Contractor has interest, expertise and data available to analyze LDC potentials in areas of roots, tubers, fruits, and vegetables. H. LDCs express interest in need for training manuals and contractor has time and expertise to develop appropriate materials.

AID 1020-20 (1-72)

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 79 to FY 83
Total U.S. Funding $2,250,000
Date Prepared: 3/6/79

Project Title & Number: Storing, Processing, and Marketing of Vegetables and Fruit

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
INPUTS: A. Contractor provide qualified consultants, backstopping, and campus facilities. USDA provides consultants under a PASA arrangement. Private firms provide consultants and specialized reports on specific problem areas. B. AID provide budget support and project monitoring. C. USAIDs, LDCs, and Int'l. organizations provide support for marketing and postharvest loss prevention activities and installations for root, tuber, and fruit and vegetable crops and products.	**INPUTS:** Implementation Target (Type & Quantity) AID Funding - ($000)	**INPUTS:** A. AID/W records. B. AID/W records. C. AID records and records of minutes of meetings of int'l. donor groups, cooperative or collaborative projects initiated.	**INPUTS:** A. That contractor will have necessary qualified manpower to respond promptly to requests for assistance by LDCs. B. That LDCs have technical or managerial personnel to participate in workshops or training exercises, or to analyze and implement recommendations of the technical assistance team. C. International lending agencies or donor groups will be willing to negotiate loans or give grants to LDCs to implement programs.

	FY 79	FY 80	FY 81	FY 82	FY 83
Contractor	49	245	245	270	296
Consultants frm.private industry	29	140	140	154	167
PASA w/USDA	11	52	52	59	67
Admin.Support	11	60	60	67	70
TOTALS	100	500	500	550	600

A. USAID/LDC: Funding of trainees as required.

B. LDC: Funding of trainees as required.

C. Other Donors: Provide supplemental loans and grants.

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AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I

1. TRANSACTION CODE: [A] A = ADD, C = CHANGE, D = DELETE — PAF

2. DOCUMENT CODE: 5

3. COUNTRY/ENTITY: DS/AGR/MA — RDA-29
Type C. Field Service

4. DOCUMENT REVISION NUMBER: [-] Original

5. PROJECT NUMBER (7 digits): [931-1323.11]

6. BUREAU/OFFICE: A. SYMBOL: DSB; B. CODE: [10]

7. PROJECT TITLE (Maximum 40 characters): [Storage & Processing of Fruits & Vegetables]

8. PROJECT APPROVAL DECISION — ACTION TAKEN: [ ] A = APPROVED, D = DISAPPROVED, DE = DEAUTHORIZED

9. EST. PERIOD OF IMPLEMENTATION: YRS. [0 5] QTRS. [0]

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 79 F. GRANT	E. 1ST FY 79 G. LOAN	H. 2ND FY 80 I. GRANT	H. 2ND FY 80 J. LOAN	K. 3RD FY 81 L. GRANT	K. 3RD FY 81 M. LOAN
(1) FN	179 I	333	-	600	-	0	-	500	-
(2)									
(3)									
(4)									
TOTALS				600	-	0	-	500	-

A. APPROPRIATION	N. 4TH FY 82 O. GRANT	N. 4TH FY 82 P. LOAN	Q. 5TH FY 83 R. GRANT	Q. 5TH FY 83 S. LOAN	LIFE OF PROJECT T. GRANT	LIFE OF PROJECT U. LOAN
(1) FN	550	-	600	-	2,250	-
(2)						
(3)						
(4)						
TOTALS	550	-	600	-	2,250	-

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

	A. GRANT	B. LOAN
	2	-

C. PROJECT FUNDING AUTHORIZED THRU FY: 8 3

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED ($000)

B. ALLOTMENT REQUEST NO. _____

A. APPROPRIATION	C. GRANT	D. LOAN
NA		
(1)		
(2)		
(3)		
(4)		
TOTALS		

13. FUNDS RESERVED FOR ALLOTMENT: NA

TYPED NAME (Chief, SER/FM/FSD)

SIGNATURE

DATE

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

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

NA

FOR PPC/PIAS	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 ALOTTMENT OF FUNDS

PART II

Entity : DS Bureau

Project : Storage and Processing of Vegetables and Fruit

Project Number: 931-1323.11

1. I hereby authorize $2,250,000 for a five year field service project on "Storage and Processing of Vegetables and Fruit."

2. The contractor for this project will be selected by a competitive bidding process.

3. This project will be incrementally funded in FY 1979 with $600,000 for the initial 18 months, in FY 1981 with $500,000 for 14 months, with $550,000 in FY 1982 for 14 months and with $600,000 in FY 1983 for the final 14 months depending on the availability of funds.

4. On November 21, 1978 an Environmental Threshold Decision determined that this technical services project was not a major Federal action which will have significant effect on human environment.

Tony Babb
Deputy Assistant Administrator
for Food and Nutrition
Development Support Bureau
Date 6.14.79

Clearance:
DS/AGR/AB:WSGreig
DS/AGR/AB:WLRodgers
DS/AGR:MMozynski
DS/AGR/DIR:DFPeterson
DS/PO:RSimpson

References:
1. Action Memo: Peterson to DAA/FN (attached)
2. Minutes of Meeting of Joint TPCA and Project REview Committee (attached)
3. PP for subject project (attached)

JUN 7 1979

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

FROM: DS/AGR/DIR, Dean F. Peterson Dean F. Peterson

Problem: Your authorization is required for a five year technical services project, "Storage and Processing of Vegetables and Fruit" (931-1323.11), the contractor for which will be determined by competitive bidding.

Discussion: Vegetables and fruits (including roots and tubers) provide the basic diet for 500-600 million people in the LDCs. On a caloric basis these crops provide around 17 to 18 percent of the total caloric intake in developing countries. In several countries, vegetables and fruit are the major source of calories and in several others provide more than half the total caloric intake. Vegetables and fruit, even in major grain consuming countries, provide much more of the diet than pure caloric content as they provide many essential vitamins and minerals. Postharvest food losses have been estimated by the National Academy of Sciences to be over 25% of the harvested crops. Monetary estimates of postharvest food losses in these crops exceeds $2 billion per year.

In addition to postharvest food loss problems, there are major problems in antiquated, inefficient and costly marketing systems and, in general, a lack of development of the agribusiness industries in this important area. This project would develop a technical services capability to reduce postharvest food losses, increase marketing efficiency and enhance agribusiness development in the vegetable and fruit industries in the developing countries.

This Project Paper (PP) was reviewed by the Technical Program Committee for agriculture subcommittee on Marketing and Agribusiness on March 27, 1979 and unanimously approved. The PP was reviewed by joint TPCA - DSB project review committee on April 6, 1979. Several issues were raised at the latter meeting and have subsequently been resolved; these were as follows:

(1) Issue: A definitive scope of work was not presented in the Project Paper: Resolution of Issue: A definitive scope of work was developed, circulated to, discussed with, and approved by the regional bureau's.

(2) Issue: The selection of a contractor. It was recommended by the joint TPCA - DSB project review committee that private firms as well as universities should have an opportunity to bid on the contract: Resolution of Issue: The PP has been revised and the RFP will be open to all bidders.

(3) Issue: Criteria for Proposal Evaluation: LAC/DR/RD, John Balis and NE/TECH/AD, Bob Morrow expressed concern regarding the fields of specialty to be covered in the project. Resolution of Issue: The text of the project paper was slightly revised, and in discussions with LA/DR/RD John Balis the criteria for proposal Evaluation was revised.

In meetings between the project manager and the regional bureaus subsequent to the April 6, 1979 review, the regional bureaus endorsed the project but raised some minor issues. The PP was changed to reflect these suggestions.

On May 22, 1979 the revised PP was reviewed by the TPCA Committee (minutes attached) and clearance in the project was granted. LAC/DR/RD John Balis and AFR/DR W. Johnson still raised some issues in subsequent Memo's to DS/AGR D. Peterson. Responses to these Memo's by the project manager are attached.

The only substantive issue remaining is one by LAC/DR/RD J. Balis who suggests changing the criteria for selection of a contractor to give a greater chance for selection of a "commercial firm." We suggest the criteria for selection remain as currently stated under which either a university or a commercial firm may be selected.

Recommendation: That you approve the five year field service project on "Storage and Processing of Vegetables and Fruit" by signing the attached PAF.

Attachments: a/s

Clearances:
DS/AGR:MMozynski MM
DS/PO:RSimpson KM for 6/12

DATE: March 27, 1979

SUBJECT: TPCA Subcommittee on Marketing and Agribusiness Review of Project Papers for Projects: Storing, Processing, and Marketing of Vegetables and Fruit (931-1323), and Reducing Farm Level Postharvest Grain Losses (931-1322)

DISTRIBUTION/ATTENDEES: Mr. S. Greig, DS/AGR/AgB
Mr. R. Hoffarth, AFR/ARD
Mr. A. Hankins, LAC/DR/RD
Mr. D. Mitchell, ASIA/TR/ARD
Mr. W. Fitzgerald, NE/TECH/AD
Ms. Joan Atherton, PPC/PD/PR
Mr. P. Gage, DS/PO

The meeting opened with a discussion of the PP for the project entitled "Storing, Processing and Marketing of Fruit and Vegetables". It was noted that loss estimates for fruits and vegetables in LDCs were very high, commencing in instances from the time of harvest and mounting as the products were either stored or moved through the marketing systems. As a result many of these products appear on the market in adequate or excess quantities on a seasonal basis with consequent vagories of price, and thus great variances in incomes to the producers. The means to eliminate, or reduce, these fluctuations involve improvements in storing and marketing these perishable items, or processing them to ensure their supply and availability beyond the normal marketing period. There are literally hundreds of products where these means might be applied thereby increasing food supplies and/or assuring producers in LDCs higher or more regular incomes.

The major point of discussion of the PP centered around the selection of a University as the implementing agent for this project. One member of the sub-committee questioned the ability of a U.S. University to recommend, or deliver,

an "appropriate technology" to an LDC. It was noted that aspects of food storage and processing may well involve some advanced technologies of the developed world but that the same technologies may be the appropriate technology for LDCs.

Of greater concern regarding the selection of a University as an implementing agency was why a commercial U.S. processor should not be selected since a commercial enterprise certainly has practical experience. This point was regarded as valid but only in terms of one specific genre of product, whereas, this proposal would address a very wide variety of products. The University would in fact draw upon relevant commercial concerns for consultant services where specific products were under study. Commerical firms, from past experience, have evidenced a built-in bias towards expanding their particular methods, utilizing their hardware. It was also noted that the project would involve some research, and it was emphasized that research would be a minor component of the project, and that a University possessed the capability for conducting research.

Some minor aspects of project design were discussed but the subcommittee unanimously approved the project and the appropriateness of a University as implementing agent.

Discussion of the PP for Reducing Farm Level Grain Storage opened with the statement that while A.I.D. and other donors have invested considerable resources in improving commercial and central grain storage facilities, the vast majority of grain produced in LDCs is stored on the farm. There have been numerous studies undertaken to estimate the postharvest grain losses but due to vagaries

of methodologies there actually are few accurate estimates of these losses. While there has been some limited work done on improving traditional storage methods only one or two studies have analized the economic returns of proposed improvements at the farm level.

The subcommittee unanimously approved the project with discussion and recommendations centering on minor points of project design and implementation. It was suggested that the sociological inputs be provided through consultancy services rather than the utilization of host country expertise. The assignment of project personnel to project sites on a long term basis may involve conflicts with U.S. official personnel ceilings set by Ambassadors from country to country.

DRAFTED:DS/PO:PGage:cjr:3/28/79:59040

Minutes of the Joint TPCA and Project Review Committee when the following projects were reviewed:

- Storing, Processing and Marketing of Vegetables and Fruits
- Reducing Farm Level Postharvest Grain Losses

Attendees: DAA/DS/FN, Mr. Tony Babb, Chairman
DS/AGR, John Wilson
DS/AGR, Mary Mozynski
DS/AGR, Smith Greig
DS/AGR, William Rodgers
NE/TECH/AD, Robert Morrow
LAC/DR/RD, John Balis
PPC/PDPR, Doug Caton
SER/CM, Virginia Perelli
GC/TFHA, Steve Tisa
AFR/DR/ARD, R. Hoffarth
DS/PO, Pat Gage
ASIA/TR/AR, Don Mitchell

DAA/DS/FN, Tony Babb welcomed the representatives from the Regional Bureaus (RBs), PPC, GC, and CM. Dr. Greig then opened the discussion of the projects by stating that the projects had been reviewed by the TPCA subcommittee and were unanimously approved. He stated that there were several issues raised on each project which are discussed in the following narratives; and that the minutes of the TPCA subcommittee are attached for ready reference.

DAA/DS/FN, Mr. Tony Babb stated that in the future all issues to be discussed at the project reviews must be submitted to him in writing at least five working days before the review. He indicated that he considers the issues raised by the RBs, PPC and other offices in the Agency very seriously when reviewing projects, and that he appreciates the involvement in DSB's projects of other offices. He said that DSB is a support Bureau and as such, must provide services that are relevant to meet the needs of the RBs, Missions and LDCs.

Storage, Processing and Marketing of Vegetables and Fruits

Dr. Greig indicated that the issues raised by the TPCA Subcommittee on Marketing and Agribusiness centered around the selection of the contractor; i.e., whether the selection should be limited to U.S. Universities or open to commercial firms. SER/CM, Virginia Perelli recommended that the contracting not be limited to U.S. Universities, but be handled by a RFP open to all bidders. GC/TFHA, Mr. Tisa indicated that the RFP could be worded in such a way that a consortium of U.S. Universities could submit a proposal. The committee agreed.

Further discussion centered around the lack of specificity in the project design and a definitive scope of work. It was pointed out that the PIO/T would contain the required definitive scope of work. However, the TPCA members recommended that these details be included in the project paper in order to define the areas of speciality required and the type of services to be procured so that the AA or DAA would know what services he was signing for.

LAC/DR/RD, John Balis and NE/TECH/AD, Bob Morrow expressed concern regarding the fields of speciality to be covered in the project. PPC/PDPR, Doug Caton suggested that the project be separated into the following categories:

- Fruits
- Vegetables
- Roots and Tubers

Messrs. Balis and Morrow suggested that a definitive scope of work must be drafted that would provide sufficient data on which to evaluate proposals when they are received.

GC/TFHA, Mr. Steve Tisa stated that a RFP could be drafted for a five-year project on the basis of specific data on the disciplines to be covered and types of expertise or specialities required. However, obligations must be limited to those activities which can be specifically defined. He also indicated that he had been given the assignment by GC, Mark Ball to draft procedures by which services could be provided by DSB contractors upon request by the RBs, Missions and LDCs.

Mr. Tisa agreed to submit a memorandum covering the procedures to be used for the field support projects.

In summary, the following actions are required:

- The project paper will be revised to define specifically what types of expertise are required and the areas of speciality. It will contain a definite scope of work.

- The RFP will be open to all bidders and the scope of work will contain definitive data on which to evaluate the proposals when they are received.

Reducing Farm Level Postharvest Food Losses

Dr. Greig stated that the TPCA subcommittee had unanimously approved the project with discussions and recommendations centering on minor points of the project design and implementation. The subcommittee suggested that the sociological inputs be provided through consultancy services rather than the utilization of host country expertise.

There was considerable discussion on the inadequacy of the project design and scope of work. SER/CM, Ms. Perelli stated that it was not clear from the Project statement what DSB would be buying, and Messrs. Balis and Morrow questioned the methodology being proposed. They indicated that the project paper states that the data will be collected one year and used by the contractor to make recommendations for reducing farm level postharvest food losses the next. The contractor will be dealing with too many variables on which to base a solid decision after only one year of research. For example, the weather may change drastically the year that the sampling is made and that any recommendations for improvement would not be based on a normal harvesting season. To avoid bias, the contractor needs to take samples for several years. Mr. Balis suggested that as a first phase, the project should only access losses. It should not deal with engineering or structural improvements to reduce losses. Dr. Greig stated that the purpose was not only to access losses, but to determine the most economically feasible methods to reduce losses.

Dr. Greig responded to the suggestions made by the TPCA committee by stating that the sampling technique has been used before very successfully and could be used for this project. AFR/DR/ARD, Mr. Hoffarth suggested that certain climatic zones should be identified and the testing technique be used in each zone over a period of several years.

NE/TECH/AD, Mr. Robert Morrow stated that he had suggested that the project cover harvest food losses as well as postharvest food losses. The project paper does not include harvest food losses. Dr. Greig responded that this project is designed specifically for postharvest food losses and that if additional funds are available, it will be expanded to cover harvest food losses.

Because there were so many issues raised on the project design and the lack of specificity in the scope of work, DAA/DS/FN, Mr. Babb requested that each member of the TPCA committee submit his/her comments/recommendations to Dr. Greig on how to improve the project statement. He stated again that he takes seriously all comments/issues raised by the RBs, PPC, and other interested Agency offices and uses them as a basis for approving or disapproving DSB projects.

This project will not be reviewed by the RAC on April as it was originally scheduled. It will be rescheduled for a later date when the issues have been resolved.

Drafted: MMozynski
4/10/79