

AGENCY FOR INTERNATIONAL DEVELOPMENT WASHINGTON, D. C. 20523 BIBLIOGRAPHIC INPUT SHEET	FOR AID USE ONLY <i>Batch 78</i>
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1. SUBJECT (CLASSI- FICATION)	A. PRIMARY	Food production and nutrition	AA00-0000-0000
	B. SECONDARY	General	

2. TITLE AND SUBTITLE
 A.I.D. supported post harvest food loss reduction activities, 1966-1976

3. AUTHOR(S)
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4. DOCUMENT DATE 1976	5. NUMBER OF PAGES 23p. 21p.	6. ARC NUMBER ARC
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7. REFERENCE ORGANIZATION NAME AND ADDRESS
 AID/TA/AGR

8. SUPPLEMENTARY NOTES (*Sponsoring Organization, Publishers, Availability*)

9. ABSTRACT

10. CONTROL NUMBER <i>PN-AAF-295</i>	11. PRICE OF DOCUMENT
12. DESCRIPTORS AID Food losses Food supply Post-harvest?	13. PROJECT NUMBER Projects
	14. CONTRACT NUMBER AID/TA/AGR
	15. TYPE OF DOCUMENT

AID/TA/AGR

PN-11F-295

A.I.D. - Supported Post Harvest Food Loss Reduction Activities, 1966-1976

Compiled by M.C. Bourne and W.E. Scarborough, June 1976

Listed below are A.I.D.-funded projects directed towards reduction of post harvest food losses in developing countries. It covers the period 1966 through to the present. Ongoing projects are included. Proposed new projects that have not yet been approved by June 1976 are not included.

The list contains those projects that are directed wholly or almost wholly to food loss reduction activities. It includes other projects that contain a significant component of food loss reduction. The list does not include activities that indirectly reduce food losses, for example, building of roads into rural areas to enable farm products to be brought to market or to a processing or storage area before they spoil; and the building of institutions such as colleges of agriculture and research institutes that have post harvest food loss activities as part of their overall program.

The list may not be complete because a number of A.I.D. projects possibly have elements of food loss reduction activities that are not specifically identified as such in reports.

The projects are classified under the following headings:

- A - Cereals, Grants, Regional
- B - Cereals, Loans, Regional
- C - Non Cereals, Grants, Regional
- D - Non Cereals, Loans, Regional
- E - Centrally Funded Projects

One additional section (F) lists again those projects already described that give a figure for an amount of post harvest food loss. These figures are probably estimates and hence their accuracy is questionable, but we thought it worthwhile to indicate the loss figures that have been cited in Congressional Presentations.

A. Cereals - Grants, Regional

1. AFRICA - Regional

a. Agricultural Production, 698-11-110-156

A multi-faceted project to increase production. One facet is to develop improved methods and facilities for village food storage in Southern Africa countries.

2. AFRICA - Central West Regional

a. Grain Stabilization, 625-11-150-600

A project to stabilize prices which includes provision of public storage facilities for Upper Volta and Niger.

b. Grain Production, Marketing, and Stabilization, 625-11-150-161

Assist West African Countries stabilize their grain supplies through better balanced production and better storage, marketing and pricing systems.

3. AFRICA - Southern

Crop Production and Marketing (Botswana), 690-11-150-056

This project is intended to develop and expand the production and marketing of sorghum, beans, and peas. Included among its provisions is technical backstopping in harvesting, post harvest storage, handling and processing of crops. The project will assist in the financing of the construction of storage facilities.

4. BOLIVIA

Basic Foods Production and Marketing, 511-11-190-451

Develop and extend improved technologies and management practices to the small farm sector with focus on cereal grains, animal proteins, edible oils, and vegetables.

5. BRAZIL

Agricultural Marketing, 512-15-150-248

A multi-faceted project that includes the goal of reducing marketing losses from 30 percent to 10 percent. A farm storage program that uses low-cost, wire mesh cribs has resulted in 240,000 tons of new storage capacity.

6. CENTRAL AMERICA AND PANAMA (ROCAP)

Agricultural Policy and Development, 596-11-150-001

This project includes feasibility studies for additional grain storage and assistance in the management of grain storage facilities.

7. CHILE

Agricultural Development, 513-11-150-194

Assist Chile in achieving a 5.5 percent annual increase in agricultural production. One component is to improve storage, transportation, processing facilities, grading and standards for agricultural products.

8. COLOMBIA

Small Farm Technology Development, 514-11-110-185

Provide U.S. specialist to work in designated areas of research which will result in practical new technologies that address major production and marketing problems of small farmers.

9. DAHOMY

a. Improvement of Grain Storage Facilities, 680-11-190-024

Provide assistance in providing small grain storages to farmers, construction of two central sites with storage capacity of 1,500 and 750 ton capacity, provision of auxiliary drying equipment, and training in the U.S. of two Dahomeans in storage management.

b. Agricultural Education and Extension, 680-11-110-007

Purpose is to help develop an agricultural extension service. One component provides for storage of fish and bait and another provides for a pilot grain storage program to curtail the heavy losses in stored grain.

10. DOMINICAN REPUBLIC

Agricultural Development Support, 517-55-190-059

Increase production of selected basic crops. Part of this project is to provide additional grain storage facilities.

11. EL SALVADOR

Agricultural Development, 519-11-110-012

To assist the government to improve its planning and design of agricultural projects. Key targets for investigation include improved storage and marketing.

12. ETHIOPIA

a. Pulse Diversification and Improvement, 663-55-130-166

Provides for assistance in crop production, credit, marketing, storage, cleaning and processing of pulses.

b. Grain Storage, 663-11-130-123

Assisted the Ethiopian Grain Corporation to improve the handling, storing, distributing and marketing of grain throughout Ethiopia.

13. GUATEMALA

Development of Agricultural Policies and Institutions, 520-11-140-148

Purpose is to promote agricultural productivity. Activities include on-the-job training for Ministry of Agriculture technicians in perishable products marketing, food quality control, and cereals storage and marketing.

14. HAITI

Agricultural Development Support, 521-15-190-069

This project provides for innovative applications of agricultural technology. One such proposed innovation is the introduction of low cost ferrocement on-farm grain storage bins to reduce losses by rodents.

15. HONDURAS

a. Core Services, 522-15-190-118

A.I.D. has provided advisory assistance for grain marketing, grain handling, and grain storage facilities as part of a broad range of services to increasing numbers of small farms.

b. Agricultural Productivity, 572-11-190-036

This plan calls for coordinated activities in a number of areas including marketing and storage of agricultural commodities.

16. INDIA

a. Agricultural Production and Promotion, 386-11-110-366

Storage facilities are being built throughout India to safeguard the additional grain that is being produced, and assistance is given in design of storage structures.

b. Increased Agricultural Inputs, 386-11-190-367

This project focuses on the main inputs to development of the agricultural sector including fertilizer, seeds, pesticides, farm machinery, grain storage and protection, and oilseeds processing. Village demonstrations of improved storage for protection of food grains and a pilot demonstration for rodent control were carried out. A peanut dryer was built, and improved oilseed processing to give better extraction of oil was demonstrated.

c. Agricultural Production Incentives, 386-11-140-282

A.I.D. provided American specialists in foodgrain storage, distribution, credit, buffer stock management, and commodity pricing because traditional and inadequate storage facilities and poor distribution and marketing procedures have depressed Indian farmer interest in increasing grain output.

17. LIBERIA

Agricultural Program Development, 669-11-190-123

Assist Liberia implement the total package of inputs necessary to increase production and marketing of agricultural crops, particularly rice. The package includes small storage, processing, and transport facilities.

18. MALAGASAY REPUBLIC

a. Food Conservation Through Rodent Control, 687-11-190-033

Assist Malagasay in eliminating the heavy agricultural losses suffered as a result of destruction by rodents of field crops and stored grains particularly rice. Rodent control experts and rodenticide chemicals were provided.

b. Assistance to Agricultural Cooperatives, 687-11-140-027

Objective is to assist rice-producing farm families increase production and improve crop processing, marketing and distribution. A.I.D. provided a consultant, several gasoline powered rice-huller polishers, and prefabricated silos.

c. Improvement of Agricultural Marketing, 687-11-190-032

This project provided trucks to transport agricultural products (principally lima beans and peanuts) to market more expeditiously in order to reduce losses due to parasites and rots.

19. MOROCCO

Agricultural Development Support, 608-15-199-036

This project includes feasibility and economic studies, cereals pricing policies, and grain storage problems.

20. NEPAL

a. Agriculture Credit and Cooperatives, 367-11-140-056

This program provides advisory services to increase food production. It concentrates on supervised credit and the establishment and operation of cooperative stores and grain storage and marketing services.

b. Food Grain Technology, 367-11-110-054

Purpose is to develop improved technology for Nepal's food grain programs, and includes construction of on-farm storage bins.

21. NIGERIA

a. Agricultural Production and Distribution, Western Nigeria, 620-11-110-150

The Agricultural Engineering subsection of this project is for planning agricultural mechanization and improving grain storage. Grain storage facilities have been constructed and 20 Nigerians were trained in the construction and installation of storage units.

b. Agricultural Engineering, Western Nigeria, 620-11-190-765

This multi-faceted program includes demonstrations of proper storage, drying, grading and handling of grain, and construction of approximately 114 bins with a storage capacity of 10,000 tons.

22. PAKISTAN

Agricultural Area Development, West Pakistan, 391-11-120-145

A 1.2 million acre area in the Punjab region has been selected for intensive development of rice and wheat. The major thrust is in increasing yields but market and storage facilities are included as part of the overall program.

23. PHILIPPINES

a. Grain Storage, Marketing, and Handling, 492-11-150-127

A.I.D. has financed surveys that are helping to correct deficiencies in grain storage, handling and marketing.

b. Bicol River Basin Development, 492-11-199-260

This project includes a program on grain handling, storage and marketing.

24. RWANDA

a. Food Storage and Marketing, 696-11-234-100

To provide for the design and construction of about eight prefecture level storage warehouses located such that all producing areas would be within 30 Km of a storage facility.

b. Reduction of Food Waste, 696-11-234-101

This project provides funds for working with cooperatives to build and operate storage facilities for grain, to reduce wastages, and to equalize supply throughout the year and thus stabilize prices.

25. TANZANIA

Agriculture Marketing and Development, 621-11-150-099

Provides assistance in accounting, marketing, storage, and pricing to the National Agricultural Products Board which handles maize, rice, wheat and oilseeds. In-service courses have been conducted in quality control for grain storage and transportation.

26. THAILAND

a. Agriculture Development, 493-11-190-180

The goal of this project is to improve the lot of the Thai farmer in the Northeast and includes the improvement of storage facilities.

b. Northeast Economic Development, 493-11-810-215

Objective is to develop and implement a comprehensive economic development plan for Northeast Thailand with emphasis on agriculture and education. An important component will be agricultural processing, marketing, storage, and other services.

27. TUNISIA

Agricultural Production and Research (Cereals), 664-55-130-205

Assist Tunisia increase wheat production. One aspect of the program is to help develop a center for marketing, storage, and production.

28. VIETNAM

Crop Production, 730-11-130-314

Purpose was to help Vietnam achieve self-sufficiency in rice production. One component is to improve the handling, storing, and marketing of rice and other crops by use of rice dryers, threshers, and farm storage tanks.

B. Cereals - Loans, Regional

29. AFRICA

a. Entente Food Production and Agricultural Credit, Phase II

Proposed loan is to provide a seed multiplication farm for corn, grain storage for corn and other grains to avoid losses due to high humidity, and education and training programs.

b. Entente Grains Storage and Cereals Marketing, 625-H-004

This loan provided storage and marketing facilities.

30. BOLIVIA

Agricultural Sector Loan II

The purpose of this proposed loan is to develop and extend new production technologies to the small farm subsector of the intermountain valleys and to provide a range of farm services. One component is the construction and equipping of storage and drying facilities.

31. COLOMBIA

Small Farmer Development, 514-T-080

The purpose of this loan is to improve the quality of life of the rural poor. Potential programs include small scale machinery and storage facilities.

32. DOMINICAN REPUBLIC

Agriculture Sector, 517-T-027

To improve the standard of living of the rural poor by means of a number of activities, one of which is investment in small market and storage facilities.

33. EL SALVADOR

Agricultural Development and Grain Marketing, 519-L-019

Funds from this loan are being used to finance such items as equipment, fencing, irrigation and storage facilities for smaller commercial farmers.

34. GHANA

Agricultural Sector Loan

This proposed loan will provide an integrated package of improved inputs, credit and market services to small farmers. Part of the funds will be used for essential transport, storage, and marketing facilities.

35. GUYANA

Rice Modernization, 504-L-008

This loan was used to help construct facilities to receive, dry, store, and process the rice crop.

36. HONDURAS

a. Agricultural Credit and Storage, 522-L-018

This loan-funded grain storage system has added more than 28,000 metric tons of grain storage capacity in Honduras.

b. Basic Grain Marketing Program, 522-L-021

This matching loan to 522-L-018 above assists in establishing a revolving fund for a grain price stabilization and marketing program. One component of the loan provides for training of personnel in drying and grain storage practices.

37. PAKISTAN

a. Feasibility Studies, 391-H-058

This loan provided the foreign exchange costs of feasibility studies in nine areas, one area being a food grains storage project.

b. Agricultural Inputs and Rural Infrastructure, 391-T-166

This loan will strengthen rural infrastructure in a number of areas, two of which are improvement in food storage facilities and the purchase of machinery for agricultural processing.

38. PANAMA

Grains and Perishables Marketing System, 525-T-042

This loan has been authorized and the agreement signed but there have been no disbursements to this date.

39. SYRIA

Grain Storage Program, 276-H-008

This loan was used to finance the U.S. dollar costs of engineering, designing, and construction of 11 grain storage facilities, one feed mill; and three certified seed facilities.

40. TANZANIA

a. Agricultural Sector Loan I, 621-T-018

This loan provided facilities to increase food crop and livestock production and marketing, development of an agricultural credit structure, and capital equipment for water development and grain storage.

b. Agricultural Sector Loan II

This proposed loan will expand the programs in livestock, regional development, grain storage and institutional and research infrastructure.

41. UNITED ARAB REPUBLIC

a. Egyptian Grain Storage Program, 263-H-015

This loan financed the foreign exchange costs of the first phase of a two phase project to engineer and construct a national system of grain storage and handling facilities in the UAR.

b. Egyptian Grain Storage, 263-K-028

Loan for construction of two 100,000 ton capacity silo installations, one at Alexandria and one at Cairo.

C. Non Cereals - Grants

42. AFRICA REGION

a. Nutrition Activities, 698-11-560-157

Among other activities this project supplied technical guidance on the feasibility of developing cottage industries based on the utilization of indigenous foods, development of standards for processed foods, and establishment of a food testing laboratory.

b. Large Unit Agriculture Production, 698-11-950-152

This project combined the efforts of U.S. Corporations with African private or public investors to develop large scale vertically integrated commercial agriculture production units that covered all aspects of growing, processing, and marketing fruit, vegetables, oilseeds, grains, rubber, livestock, poultry, and included automated processing plants.

c. Surveys and Feasibility Studies, 618-11-990-615 (East Africa)

This project assisted the East Africa community to prepare sound regional technical assistance programs including a feasibility study of cold storage facilities for meat.

43. ASIA - EAST, REGIONAL

Asian Vegetable Development and Research Center, 498-11-130-212

The purpose of this grant was to improve the production, processing, and marketing of vegetables in East Asian countries. One component of the Center's activities is to perform research on food preservation and storage practices.

44. BRAZIL

Technical Support, 512-11-990-000

This project provides support for all program operations of the total Brazil program. It has included the funding of the training in the U.S. of five Brazilian officials in the programming, shipping, warehousing and control practices for Food For Peace commodities.

45. GUATEMALA

Development of Agricultural Policies and Institutions, 520-11-140-148

See Item # 13.

46. GUINEA

a. Palm Oil Extraction, 675-11-230-014

A.I.D. provided assistance in the construction and initial operation of a pilot kernel processing center to utilize the palm fruit that grows extensively in Guinea.

b. Manioc Starch Plant, 675-15-230-030

Provided for the establishment of small plants for the processing of Guinea-grown manioc into tapioca starch which can be used locally for human consumption, as a poultry feed, as sizing for textile plant, or for export.

47. HAITI

Small Farmer Marketing, 521-15-150-083

This grant is designed to establish a network of producer-owned food and coffee marketing cooperatives. It includes increasing storage and holding space, and construction of a coffee processing and storage facility.

48. INDIA

a. Animal Husbandry, 386-11-130-041

This project helped to expand production, processing and marketing of poultry in the state of Punjab. The project provided collection centers, refrigerated motor transport and adequate storage and outlet facilities at principal markets.

b. Export Promotion, 386-15-260-384

This project assisted the Government of India to carry out surveys of Indian export commodities including fresh and processed fruits and vegetables, seafood and cashews.

49. JAMAICA

a. Agriculture Production and Marketing, 532-11-140-023

Among a number of projects this grant assisted the Government of Jamaica establish two dairy training centers and in increasing food processing facilities.

b. Inland Fisheries Development, 532-11-180-038

Will create the institutional and technical capability to design and implement an inland fisheries program involving research, experimentation fish farm development, storage, marketing, and distribution.

50. KENYA

Fisheries Development, 615-11-180-130

This project helped to develop the fishing industry of Kenya. A.I.D. assisted in the following areas: a) marketing, and transport facilities to nearby small marketing centers; b) fish handling facilities; c) improved techniques for processing salted, dried, and smoked fish; and d) expansion of fish meal utilization.

51. KOREA

Korea Institute of Science and Technology, 489-11-230-634

Purpose was to create an industrial institute that will contribute to the growth of Korean industry through introduction of applied science and technology. Food science and technology represents a significant proportion of the activities of KIST.

52. NIGERIA

a. Agricultural Production and Distribution, 620-11-130-774

One subsection of this total program provided for assistance in the construction and operation of a demonstration abattoir and cold storage facility in Kaduna and two retail outlets that will introduce modern marketing techniques. A partially A.I.D.-financed slaughterhouse is operative and two cold storage units were constructed.

b. Fisheries Development, 620-11-180-704

Assisted Nigerian cooperatives increase the production and improve the storage and marketing of fish to reduce spoilage and losses.

c. Livestock Development, Western Nigeria, 620-11-130-767

Helped establish a program of livestock production and marketing in Western Nigeria. A small meat laboratory and cold store were established. Milk quality has improved by using flake ice and by providing new pasteurization and bottling facilities.

53. PAKISTAN

a. East Pakistan Small Industry Development, 391-11-240-258

This grant promoted the development of small industries in East Pakistan including rice mills, fish freezing plants, bakeries and cold storage facilities.

b. Village Level Food Processing, 391-11-190-406

This project is studying the existing local extraction processes for sugar cane, oils from rapeseed and mustard seed, with a view to increasing the amount of food extracted from these crops.

54. PERU

Research and Development in Fresh Water Fisheries, 527-11-160-144

The development of commercial fisheries in highland lakes, streams, and fish farms managed by cooperative enterprises in the Peruvian Sierra. A complementary pilot commercial processing and marketing outlet will be developed also.

55. PHILIPPINES

Food and Nutrition, 492-69-560-250

Assist the Government of the Philippines in the development of a Food and Nutrition program designed to reduce malnutrition among infants and children. A significant part of this program is technical assistance from two U.S. colleges in the areas of food processing, preparation, and preservation.

56. URUGUAY

Agricultural Institutional Development, 528-11-110-041

A.I.D. contract technicians will assist the Ministry of Agriculture and Fisheries with specific production and marketing problems of fruits, vegetables, and citrus, and in strengthening the agricultural research system.

57. ZAIRE

Fishing Cooperatives Expansion, 660-11-180-056

This project is assisting Zaire's capabilities in fish production, processing, and marketing in the Lake Tanganyika area.

D. Non Cereals - Loans58. AFRICA - SOUTHERN REGIONAL

Botswana Northern Abattoir, 690-T-008

This proposed loan will finance the construction of an abattoir, adequate chilling and cold storage facilities and a meat processing plant.

59. COSTA RICA

Wholesale Produce Market, 515-L-013

This loan financed 66 percent of the cost of establishing the first modern wholesale produce market in San Jose. Better storage and distribution is expected to reduce spoilage losses by up to \$360,000 per annum.

60. GUATEMALA

Small Farmer Marketing Systems

The purpose of this proposed loan is to expand production by small farms of diversified crops and to develop physical facilities for processing, packaging and distributing fresh and processed fruits and vegetables.

61. JAMAICA

Dairy Development, 532-L-005

This loan was used to assist the development and expansion of dairying in Jamaica.

62. NIGER

Development Bank, 683-H-001

This loan assisted in financing the foreign exchange costs of private industrial and commercial enterprises. Among the industries financed were food processing, slaughterhouses, cans and containers.

63. PERU

Food Marketing, 527-L-049

This loan was used to modernize and bring more effective scale economics to both the urban and rural food distribution and processing systems.

64. SOMALI REPUBLIC

a. Development Bank #35, 649-A-001

A subloan from this loan was granted to assist in the construction of a fish freezing plant on the north coast.

b. Somali-American Fishing Company, 649-B-003

This loan was used to establish a freezing plant for fish caught by Somali fishermen in the Indian ocean and the Gulf of Aden.

65. UNITED ARAB REPUBLIC

Edfina Canning Plant, 263-A-007

This loan financed the foreign exchange costs of equipment to be used for expansion and diversification of canning and seafood processing operations by providing food preservation machinery thereby encouraging perishable crop growth.

E. Centrally Funded

66. Inheritance and Improvement of Protein Quality and Content in Sorghum Vulgare, AID/csd 1175

This project to improve the protein content of sorghum contains a component of storage for sorghum.

67. Role of Agricultural Price in Economic Development, AID/csd 1438

This project includes analysis of the rice milling industry with a view to modernization and increasing the output of whole grain from rice milling operations.

68. The Impact of New Agricultural Technology on Rural Employment and Income, AID/csd 2805

Includes an analysis of rice milling technology in India.

69. Comparative Study of Food Marketing Systems in Latin American Countries in Early Stages of Economic Development, AID/csd 786

This large project analyzed marketing systems and identified ways of making improvements, including reduction of food losses at the wholesale and retail levels.

70. Preparation of a Plan for Orientation of Research on Cassava, AID/csd 2497

This was a world-wide literature compilation and evaluation of all aspects of cassava, including harvesting and storage problems.

71. Pest Management and Related Environmental Protection, AID/TA-C-1195

This project provides technical assistance in the field of pest and pesticide management to maximize food production consistent with environmental and ecological considerations. It includes pests in the field and the store.

72. Adaptation of an Integrated Rice Milling Process and Development of Resultant Food Products for Use in Southeast Asia, AID/csd 1583

The purpose was to improve the rice milling process so as to recover, for human consumption, some of the oil and protein that is presently lost.

Research on New Processing Technology for Oilseed Proteins, PASA RA-112-000

Purpose was to develop methods for making the protein content of oilseeds (cottonseed, peanuts, soybeans) available for human consumption. In traditional processing most of the protein is lost for human consumption.

74. Coconut Products for Use in Foods, AID/csd-2604

Objective was to develop a project that would extract edible protein as well as oil from coconut. Existing practice extracts the oil but does not use the protein of the coconut.

75. Development of Conservation Processes for Fish By-Products, AID/csd 1904

This project focused on developing better preservation techniques with emphasis on: 1) development and application of improved processes of drying, salting, and smoking fish; 2) proper use of wood smoke to stabilize the residual oil in anchoveta meal; 3) liquefaction of anchoveta by microbiological fermentation and subsequent treatment to yield a stable product.

76. Control of Vertebrate Pests, PASA RA(ED) 1-67

The purpose of this project is to find better means of controlling rodents, noxious birds, and vampire bats that take a heavy toll of food supplies in less developed countries.

77. Technical Assistance in Food Grain Drying, Storage, Handling, Transportation, and Marketing, AID/TA-C-1162

This longstanding contract covers the following activities: 1) helps diagnose and solve food grain drying, storage conditioning, handling, transportation, marketing, and processing problems in cooperating countries; 2) conducts training courses, seminars and conferences on these subjects for A.I.D. and DC personnel; 3) responds to technical inquiries; and 4) conducts trials, with lateral technology transfer, to adopt storage techniques to needs and to benefit small farmers, farmers and villagers.

78. International Rice Research Institute, AID/ta-1208

A.I.D. has been making substantial contributions to the IRRI programs since 1968. Among the projects supported in the Department of Agricultural Engineering is a significant research program in the drying of rice (including use of solar heat collectors); cleaning of rice; and milling of rice to give an increased turnout of whole grain.

Food for Peace

Organizes one or two regional week-long seminars each year for persons who handle USA commodities in DCs. The seminars provide a review of the methods for reducing food losses through protection, proper handling, and preservation of stored foods including domestically produced foods and foods imported under PL 480 and commercial channels. The seminars focus on the causes of food losses and corrective actions necessary to prevent them.

80. Voluntary Agencies

A number of the voluntary agencies that are supported by A.I.D. are active in designing and demonstrating methods for drying and storing grains on small farms in order to reduce losses from molds, insects and rodents; in teaching methods of food preservation in the home or village; and in other activities that reduce food losses in DCs. As an example, Volunteers for International Technical Assistance (VITA) published, "Village Technology Handbook" in 1965 and brought out a revised edition in 1970. This handbook contains a 26 page chapter on Food Processing and Preservation. 15,000 copies of this handbook have been distributed during the last five years.

81. Post Harvest Grain Losses: Development of an Assessment Methodology, AID/ta-G-1314

The project will develop a standard methodology for assessing the extent of weight loss in cereal grains in developing countries, test and refine the methodology in field studies and prepare a manual that can be used in DCs to assess food losses.

F. Projects That Cite A Loss FigureItem No.5. BRAZIL

Agricultural Marketing, 512-15-150-248

One goal of this multi-faceted project is to reduce marketing losses from 30% to 10%.

9. DAHOMEY

Agricultural Education and Extension, 680-11-110-007

One goal of this project is to develop a grain storage program that will curtail the heavy grain losses of 30% to 40% that is suffered each year by individual farmers.

14. HAITI

Agricultural Development Support, 521-15-190-069

Includes introduction of low cost ferrocement on-farm grain storage bins to reduce losses by rodents, which losses are estimated at 30% of production.

18a MALAGASAY

Food Conservation Through Rodent Control, 687-11-190-033

It is estimated that upwards of 20% of the total crop in the principal rice producing areas of Madagascar is destroyed or damaged by rats every year.

24. RWANDA

Food Storage and Marketing, 696-11-234-100

Improved centralized warehouses will reduce storage losses which run as high as 25% with some crops.

39. SYRIA

Grain Storage Program, 276-H-008

The present method of harvesting cereal grains in Syria and the lack of facilities to receive, handle, and store grain properly has resulted in field losses of 5% to 15% per year, and storage losses of an additional 8% from insects, rodents, and other spoilage.

Item No.41 UNITED ARAB REPUBLIC

Grain Storage Loan, 263-H-015

Physical losses of grain caused by insects, rodents and related damage have been estimated at more than 128,000 tons valued at about ten million dollars, almost 8% of the grain consumed by UAR.

52b NIGERIA

Fisheries Development, 620-11-180-704

At least one fourth of all fish caught spoil due to lack of cold storage and poor curing and shipping.

53b PAKISTAN

Village Food Processing, 391-11-190-406

Only 60% to 70% of available sugar is extracted from cane, and 50% to 60% of available oil extracted from rape and mustard seeds by traditional village processing techniques.

SRI LANKA

Rice Processing and Storage

This proposed loan is intended to reduce losses and wastage rates in post harvest rice from current levels of 15% to a nominal rate of 5%.