

A.I.D. GRAIN STORAGE PROGRAMS

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The Agency for International Development (A.I.D.) is involved in grain storage programs in a variety of ways throughout the world. Unfortunately the grain storage activities are not administered or controlled centrally by any one group within A.I.D. This being the case, it is rather difficult to assemble and present a complete accounting of grain storage activities which have, or are being carried out by A.I.D.

I would first like to mention some of the broad areas where A.I.D. is indirectly supporting grain storage studies and activities.

In early 1971 a Consultative Group on International Agricultural Research (CGIAR) was founded with its main purpose to mobilize long term financial support from international agencies, governments and private sources for financing international agricultural research institutions. Nineteen donor members are presently supporting six international centers with contributions approximating \$33 million with 1975 contributions expected to be near \$47 million. U.S.A.I.D. is providing about 25 percent of the core and capital budget requirements of the centers and other CGIAR activities. A small portion of the efforts of a few of the centers is being directed at grain storage and related activities. Through A.I.D., the United States also contributes to the United Nations and FAO and we are all aware of the extensive work done by FAO in the field of grain storage.

More directly, A.I.D. is involved in grain storage projects in developing countries through its' various Bureaus. At present, there are four major Bureaus which encompass the developing nations of the world. These are the Africa, Near East/South Asia, East Asia and Latin America Bureaus. Grain storage projects may either be conducted on a regional or individual country basis. Recently more emphasis has been directed toward regional type programs. As an example of the regional type effort I would like to briefly cite one program that is currently in progress.

The example involves the development of a grain stabilization program in Central West Africa. In 1971, A.I.D. began major grant assistance to the Entente Fund as part of a multi-donor financed program of assistance to the cereals subsector in Upper Volta and Niger. The objective of the program is to support market participation of national cereals offices in the above countries in order to bring about a modification in market performance which will increase prices to farmers, reduce the price spread between purchase and resale, and regularize the flow of

grain from farmer to consumer. The strategy for market intervention is an outgrowth of an analysis of the sector made by the Entente Fund and the governments of Upper Volta and Niger with A.I.D. assistance.

In 1972, A.I.D. authorized a loan of \$1.8 million to finance the construction of 30,000 MT of warehouse facilities for the national cereals offices. A.I.D. grant funds totalling \$630,000 to date have financed technical assistance in grain marketing and storage to the Entente Fund, Upper Volta and Niger. In addition, funds generated by the authorized sale of PL 480 grain have been made available to national cereals offices to cover a portion of their initial operating costs. CIDA (Canada) and FAC (France) have provided substantial support to this project, also.

Each of the countries within the major Bureaus has an A.I.D. Mission. The Mission staff works closely with the host country government in developing the types of A.I.D. assistance which will be undertaken. Whether or not a grain storage program is developed and the extent of the program within a specific country is determined by many factors. Each host country and A.I.D. Mission has to establish priorities and allocate their resources to the most important problems. In many countries there are no A.I.D. grain storage efforts; in others there are quite extensive programs. The programs may deal with very specific problems, such as the development of a farm storage unit in Nepal to very broad programs such as incorporating a grain marketing structure into the total agribusiness sector of the Philippine economy. A current program in El Salvador involves a grain marketing loan of \$6.5 million to upgrade existing facilities, establish 35,000 MT of additional storage, provide technical assistance and training and provide working capital.

To assist in providing technical expertise in grain storage and marketing to Missions throughout the world, A.I.D. established a contract with the Food and Feed Grain Institute at Kansas State University in 1967. The original intent of the contract was to have a team of grain storage experts consisting of an entomologist, grain scientist, storage engineer and a marketing economist assembled at KSU to respond to requests from A.I.D. Missions for technical assistance. Assistance was to be provided in the areas of grain drying, storage, handling and transportation with the main emphasis directed at farm level storage problems. The original contract also provided for Kansas State University to provide training and to conduct research in the solution of problems encountered in the field. The team of experts assembled in the Food and Feed Grain Institute at Kansas State University are available "on call" to A.I.D. Missions throughout the world. Being "on call", the team responds to host country Mission requests which, for the most part, have not been directed at farm level storage problems.

Over the past seven years that the Food and Feed Grain Institute has provided technical assistance in grain storage, marketing and related problems, the requests for assistance and

activities under the contract have been quite varied in nature and scope. The Kansas State University team now consists of three part-time agricultural marketing economists, two part-time grain storage engineers, a grain scientist/entomologist and as the need dictates, various consultants.

Efforts of the team have been divided between supplying technical assistance to U.S.A.I.D. Missions worldwide, training activities, and conducting adaptive and developmental research on grain storage, marketing and processing problems.

Technical assistance has been supplied under the Kansas State University contract on a short term basis of one week to two months rather than on an extended tour basis, however, this status may change if current plans materialize. Technical assistance provided under the Kansas State University contract can be placed into two major categories: (1) Specific technical assistance requests and (2) Pre-and Post-Feasibility Study Assistance. In the past seven years, team members and consultants have responded to over 30 requests for technical assistance of a specific nature from 25 countries. The types of activities in this category of assistance include making recommendations for emergency grain storage of bumper crops in Pakistan and Morocco; designing grain collecting stations for Honduras; evaluation of an elevator design in Honduras; recommendations for minimizing the loss of corn imported by Indonesia; design of a corn handling facility for Indonesia; recommending storage management practices to reduce losses in Jordan; implementation of bulk handling facilities in Colombia; recommendation for price reporting, bonded warehousing and other functions needed in a total marketing system for Guatemala; development of a warehouse law for Paraguay; etc. In addition to in-country assistance, staff members have responded to over 40 technical inquiries on grain storage, drying, pest control, quality, preservation, etc. from over 20 different countries and 3 international organizations.

Pre-feasibility assistance includes gathering information and laying the ground-work for full scale feasibility studies. Our teams have made initial evaluation of grain storage and marketing systems in 12 developing countries and have provided guidance in direction and scope for the full scale studies wherein data are developed which eventually can lead to A.I.D. financing grain storage programs on a loan basis. The Entente Fund previously mentioned is an example.

Post-feasibility assistance involves evaluating full scale feasibility recommendations presented by consulting firms. Here our assistance has the advantage of providing an unbiased team approach to evaluation. In making nine such evaluations, we feel our teams have been instrumental in preventing costly errors in locating storage facilities, financing improper types of facilities, and providing for better quality maintenance of stored grains.

One of the most important aspects of the assistance Kansas State University provides in grain storage to developing

countries is training. As a result of our activities overseas, one of the greatest deficiencies we have noted is the lack of basic knowledge on proper grain storage and marketing methods. One of our major efforts over the past five years has been to conduct an annual 8-week long Grain Storage and Marketing Short Course. The participants are sponsored by A.I.D. and other international organizations, included FAO, IITA and the Ford Foundation. Participants receive one week of orientation in Washington, D. C. followed by 5 weeks of intensive lecture, laboratory, demonstration and field trip training. After the five weeks at Kansas State University, participants spend two weeks in the Houston, Texas area observing rice production, drying, storage and processing, and visit port facilities. This course, directed primarily at the warehouse or elevator manager level, includes basic fundamentals of grain storage; inspection and grading; handling, conditioning and storage structures; sanitation (which includes pest biology, identification and control); and grain marketing economics, operations and management. One hundred and eleven participants from 26 different countries have attended the Short Course. This past year we were able to give 5 graduate or undergraduate credits to participants currently enrolled in U. S. universities for completing the Short Course.

Team members have also been involved in providing in-country training. A one week Grain Sanitation Workshop was held in India for 24 participants in 1969, and Grain Storage and Marketing Seminars were held in three different countries for a total of 210 participants.

In addition to the Short Course, two other types of on-campus training are provided under our A.I.D. Grain Storage and Marketing contract. Academic training leading to the Masters and Doctorate degrees in Grain Science has been provided for four engineers from Colombia and one from the Philippines; one Costa Rican in the area of quality preservation; and three grain marketing men from Korea, Venezuela and Ethiopia. Our team members also play host to numerous AID/USDA touring grain storage and marketing group short courses.

The project that Kansas State University has with A.I.D., as I have indicated, is primarily an "on-call" technical assistance program. However, we do have the opportunity to conduct some research when we encounter problems in the field which require additional research to provide a solution to the problem. Our research to date has involved both economic and technical aspects of grain storage and marketing. Time does not permit going into each of the research projects in detail so I will try to outline in a brief way the various projects on which we have been working.

Our economists have developed and are refining a master projection model for estimating future requirements for grain storage and marketing facilities and functions. In the past, too many "white elephants" in the form of various types of storage structures have been built with too little regard for need and/or location. Hopefully by better planning some of this type of waste

can be eliminated. In addition, our economists are also developing criteria to evaluate the economic components of the technical aspects of grain storage. Such problems as "is it more economical to store rice in the rough or milled form, and still maintain the desired level of quality" and "can the farmer in a developing country afford to build better storage structures, or apply pest control measures to preserve his grain."

Our engineers have been working on development of a simple drying and storage unit applicable to humid tropical areas. Laboratory studies on use of dessicants for drying and maintaining grain quality in storage have been completed and we are in the process of ending studies using this technique on quarter-ton lots of corn. This coming year we anticipate field testing the units under actual tropical storage conditions.

In conjunction with our development of the simple storage unit we have also conducted studies on the hygroscopic properties of beans, various rice varieties and sesame. This has formed a basis for our evaluation of wetting of grain stored in bulk and in bags under tropical conditions.

We have also initiated preliminary work on development of a farm loss survey. We are in the process of evaluating methods for estimating losses and hope to conduct a farm loss survey in a tropical country beginning late next year. It is our plan to evaluate losses sustained in various types of indigenous storage structures and to later make recommendations on how these losses may be reduced. Emphasis will be placed on the storage environment and grain management practices at the farm level.

In association with our technical assistance, training and research efforts we have endeavored to build a library of information on grain storage, marketing and processing which we are incorporating into an information retrieval system. We also have accumulated over 1,000 projector slides on storage conditions throughout the world. Over 50 reports and manuals have also been prepared in conjunction with our activities. Unfortunately many of the reports are of a rather specific nature and we do not reproduce large numbers of them for distribution. For this reason, we have not developed a general mailing list for our reports.

I should point out also that Kansas State University was recently invited to become the Agency for International Development representatives in the Group for Assistance on Storage of Grain in Africa (GASGA). We look forward to association and cooperation with the five other international organizations comprising this group.

I am certain the Agency for International Development will continue to be involved in grain storage activities in a variety of ways. Every indication is that the type of work we have been doing at Kansas State University will continue and be expanded. We look forward to greater involvement in training and research activities as well as cooperative work with other international organizations. Hopefully, with the combined efforts of concerned individuals, such as those of you at this Conference,

the people of the world will have a more wholesome and nutritious food supply in the future.