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# SECOND ANNUAL REPORT

Review of Activities
July 1, 1968 through June 30, 1969

Prepared for the

AGENCY FOR INTERNATIONAL DEVELOPMENT

AID/csd-1588
Technical Assistance in
Food Grain Drying, Storage, Handling and Transportation

at the
FOOD AND FEED GRAIN INSTITUTE
KANSAS STATE UNIVERSITY
MANHATTAN, KANSAS 66502

Dr. William J. Hoover, Director
Dr. Harry B. Pfost, Agricultural Engineer
John R. Pedersen, Entomologist

SECOND ANNUAL REPORT

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# SECOND ANNUAL REPORT

## TECHNICAL ASSISTANCE IN FOOD GRAIN DRYING, STORAGE, HANDLING AND TRANSPORTATION.

AID/csd-1588
FOOD AND FEED GRAIN INSTITUTE
KANSAS STATE UNIVERSITY, MANHATTAN, KANSAS

On July 1, 1967, an agreement was entered into between Kansas State University and the Agency for International Development under which Kansas State University agreed to provide technical assistance to the Agency for International Development and its missions in developing countries in the solution of problems involving the drying, storage, handling and transportation of grain or grain products.

The Food and Feed Grain Institute was charged with carrying out the University's responsibilities under the contract as requested and authorized by AID.

## SCOPE OF WORK

It was agreed that technical assistance would include:

1. Assistance and consultation in review and evaluation of technical assistance projects related to post-harvest grain handling practices.

2. Advise and assist in the planning, organization or reorganization and implementation of grain marketing* programs and facilities.

3. Identification and analysis of problems in grain drying, storage, handling and transportation and recommendations of means for solution.

4. Advise on planning, design and construction of physical facilities required for grain marketing* programs.

5. Planning and execution of grain drying, storage, handling and transportation training seminars, courses and/or conferences.

6. Functioning as an information center for questions and inquires relating to grain marketing* programs and technology.

7. Preparation, editing and reproduction of written and illustrated instructional, informational and reference publications on various aspects of grain marketing* for use by AID.

8. Development of methodology and design criteria through research and review to minimize problems attendant to grain marketing programs.

9. Such other technical assistance as may be mutually agreed on by AID and Kansas State University.

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* Grain marketing includes all operations of drying, storing, handling and transporting of grains from time of harvest until consumed.

# REVIEW OF ACTIVITIES
July 1, 1968 - June 30, 1969

The following review outlines, in brief, activities during the second year of the contract. It is divided into three major sections as follows:

I. Foreign Travel Assistance
II. Foreign, Non-Travel Assistance
III. Domestic Activities
   A. Travel and Conferences
   B. Non-Travel

Each activity is disucssed briefly indicating the problem, personnel involved, summary of activities and reports submitted.

## I. Foreign Travel Assistance

### A. KOREA - September 1968.

USAID/Korea requested a study of the problems of the grain food supply of Korea from the farm and port to market. A statement of the objectives and scope of work was prepared by Mr. William F. Johnson, East Asia Technical Advisory Staff, Bureau for East Asia, AID/Washington.

The objective of the study was to provide assistance in assessing the adequacy of existing facilities and determining the economic and technical feasibility of improving the grain storage, handling, processing and distribution system in the Republic of Korea (ROK). The end goal was a rational system of grain supply management by the Republic of Korea Government (ROKG) that would achieve a proper balance of supplies for the people with stabilization of prices for the producer and the consumer at levels that would result in incentives for the domestic producer.

A three man team, headed by Mr. Alden A. Ackels, a grain management consultant, was selected to make an initial study. The other members of the team were Dr. Patrick J. Gormely, Assistant Professor of Economics at Kansas State University and Mr. Martin Keck, a cereal grading specialist.

The teams' scope of work was in two specific parts:

1. Survey the needs for an overall grain storage, processing, and distribution system and based on the findings, recommend the further feasibility studies and engineering design needed.

2. Review the preliminary loan application proposal of the ROKG for funds to build thirty insulated grain storage warehouses, with total space for 108,000 metric tons.

In the belief that USAID and ROKG would require further work before loans for facilities would be granted, the team made their study and prepared their report in the format required by Manual Order 1221.2, "Feasibility Studies, Economic and Technical Soundness Analysis, Capital Projects". Manual order requirements were beyond the scope of this study, however, the team approached the study in a manner designed to establish the additional work needed to meet the manual requirements and to make the work useful to those who may prepare a detailed feasibility study without retracing the same ground.

Recommendations for improving the grain storage, processing and distribution system were made in two general categories: (1) those items which the ROKG, with nominal assistance from USAID/K, should be able to accomplish at little expense to the ROKG and with considerable potential benefit and (2) those items which require expert study to refine data, in the form of a feasibility study.

Under the first category, recommendations were made regarding dissemination of information on proper farm storage, revision of warehouse classifications and inspections, action on sanitation practices, consumer testing of rices of different moistures, improving rice milling practices and three areas of finance regarding storage construction, storage leasing and pricing policy.

The recommended feasibility study, outlined the various areas to be considered and manpower requirements. One of the main objectives was to determine which of two alternatives to grain quality preservation should be employed: drying or refrigeration. The outcome of this portion of the study would bear directly on the adviseability of the loan for construction of 108,000 metric tons of insulated storage. Other major areas of the feasibility study were storage facility locations, storage construction, storage capacities, etc.

This study was reported in "Review of Grain Storage, Handling Processing and Distribition Problems and Proposals in the Republic of Korea". Food Grain Drying, Storage, Handling and Transportation Report No. 6, September 1968.

Distribition of this report was primarily made through the USAID/Korea,

B. HONDURAS - October 1968.

A request from the USAID/Honduras Mission was received for assistance and consultation: (1) in developing recommendations for the training of personnel for the operation of grain storage facilities and the marketing of grain, (2) in developing a plan for the Government of Honduras for the use of technical assistance in grain storage, marketing and price stabilization, and (3) in developing general recommendations for more efficient administration and operation of the proposed grain storage and marketing system. In addition, the assistance of one of the team members sent to the Honduras was requested in evaluation of the design of elevators proposed for construction in Honduras.

This constituted our second opportunity to work with the USAID/Honduras Mission. Our first involvement was the review of Mr. Norman M. Ward's report "Evaluation of Banco Nacional de Fomenta, August 22, 1967", with special emphasis on the section dealing with grain storage and marketing facilities in the Honduras.

A two man team composed of an agricultural economist, Dr. John H. McCoy, and a marketing and operations specialist, Mr. Dwight S. Tolle, were sent to Honduras to provide the requested assistance and consultation.

This team made recommendations for training elevator and warehouse managers and other key personnel by outlining the qualifications and areas of training that should be provided. They further explored existing training courses and potential alternative courses that could provide the desired training. One possibility suggested was training at Kansas State University. On return to the United States, this team, working with other project team members, tentatively outlined a Grain Storage and Marketing Short Course designed to provide the type of training recommended.

Recommendations for the use of technical assistance in grain storage and marketing included outlining the duties and functions of a Grain Storage Technical Advisor (GSTA) and a Grain Marketing Technical Advisor (GMTA), to work with Banco Nacional de Fomento (BNF) in establishing policy and operations functions.

General recommendations were also made with respect to improvement in efficiency of the grain storage marketing system and related agricultural activities. Included were such items as: weights and measures, grain grading, warehouse licensing and examination, warehouse receipts, market information, licensing grain dealers, price support and stabilization, etc.

Mr. Dwight Tolle, marketing and operations specialist, made a side trip at the request of USAID/Honduras to examine plans for elevators to be built for BNF at San Pedro Sula and Tegucigalpa. His report indicated that the elevators were more elaborate than necessary to be functional and that some savings could be realized by minor alterations in the plans.

Mr. Tolle's recommendations regarding the elevator plans were reported by a letter to Mr. Carrol Deyoe, Head of the Agriculture Section, USAID/Honduras on October 30, 1968. The team recommendations were made in a 13 page report entitled "Implementation of Grain Storage Operations, Marketing Services and Price Stabilization in Honduras", Food Grain Drying, Storage, Handling and Transportation Report No. 8, October 1968. Report distribution was as follows:

USAID/Honduras
- Mr. Carrol Deyoe - 20 copies

USAID/Washington
- Bureau for Latin America/Honduras - 20 copies
- Mr. Carl F. van Haeften, WOH, - 10 copies

C. WEST PAKISTAN - October 1968

An assessment of food grain storage facilities in West Pakistan and schemes for materially increasing available storage capacity in the immediate future at minimum cost was requested through USAID/Pakistan.

Mr. Leo T. Wendling, Extension Agricultural Engineer, Kansas State University traveled to West Pakistan to make the assessment of storage facilities. Mr. Wendling's assessment was limited to storage facilities for

wheat and rice and considered only (1) schemes for increasing storage capacities within the immediate future and (2) modifications in food grain storage management which would minimize in-storage losses. A more complete study for solution of West Pakistan's long-range food grain storage and management problems was recommended.

The urgency of this assessment was exemplified by the fact that a sizable amount of the 1968 wheat crop was stored in temporary or emergency facilities not well adapted to quality maintenance for extended periods. It was estimated that roughly 300,000 to 500,000 long tons of additional food grain storage would be needed to accommodate 1969 food grain production.

Evaluation of existing storage conditions was made by visiting and inspecting storage facilities and conditions in government, leased and private sectors.

Mr. Wendling's report included only "short run" recommendations that could be initiated prior to the 1969 harvest. Recommendations for increasing storage capacity included:

1. Making maximum use of existing house-type godowns by stacking bagged grain higher, modifing godowns to make porch areas suitable for safe temporary storage, bulk storage of grain within bulk-heads formed of bagged grain and modification of godowns for bulk storage.

2. Development and initiation of a program to encourage immediate expansion of quality storage in the private sector by providing economic incentives, engineering services and plans for farm-size godowns together with an information program to inform producers of the incentives and services available.

3. Expansion and acceleration of the government food grain storage facility construction program.

Recommendations for minimizing food grain losses in storage included:

1. Establishment of a regular grain inspection program with specific schedules for pest control and grain quality maintenance.

2. Training of managers of storage centers in latest insect, rodent, and bird control methods.

3. Equiping the storage centers with the tools and materials needed for effective inspection and pest control.

At a date in the near future an in-depth study of West Pakistan's "long-range" food grain storage and management needs was recommended. Such a study should include the total grain storage and management needs from cultivator to consumer, i.e. storage facilities, transportation, marketing, quality controls, handling and processing. Such a study would provide valuable guide line data for the development of an orderly, economical, and efficient grain management program designed to accomodate Pakistan's needs and growing agricultural production. Kansas State University, under existing contract arrangement with USAID, could provide technical assistance on such a study.

Results of Mr. Wendling's assessment were reported in Food Grain Drying, Storage, Handling and Transportation Report No. 7, "Assessment of Food-Grain Storage Facilities - West Pakistan, 1968". Reports were distributed as follows:

USAID/West Pakistan
Mr. Curry Brookshire - 20 copies
USAID/Washington
NESA/Tech - 20 copies
Mr. Carl F. van Haeften, WOH - 16 copies

D. MOROCCO - April 1969

Kansas State University through the Food and Feed Grain Institute contract with AID to provide technical assistance in Food Grain Drying, Storage, Handling and Transportation was requested to participate in a study of the grain storage problems of Morocco.

A Kansas State team composed of Mr. Alden A. Ackels, grain management consultant and team leader and Mr. John R. Pedersen, Entomologist at Kansas State University traveled to Morocco to evaluate the grain storage problem and make appropriate recommendations. Their report is intended to provide recommendations for solutions to problems or to suggest further work that needs to be accomplished to arrive at economic plans for action. Although this study could not provide the depth of detail and verification required by Manual Order 1221.2 the data presented may be used as a basic guide to the work needed for the fulfillment of Manual requirements.

Review of the grain storage situation in Morocco presented two clearly defined problems: (1) The glut of grain resulting from the bumper 1968 crop filled most of the existing storage space and left very little covered storage for the 1969 crop, and (2) Modernization of cereal production methods and improved varieties should yield constantly increasing volume of grain to be handled and stored in the commercial sector.

The present lack of storage space can be relieved by every agency of government offering all idle space for temporary storage of the surplus grain. Of specific potential, are hangers, warehouses, fuel storage tanks and other buildings at idle air bases. Port elevators at Casablanca and Safi should be utilized for storage and a minimum of "transit" space held. Flour mills should be induced to fill existing storage space. Storage fees should be offered to public warehouses and other businesses which might have space available for safe grain storage. Export policies should be established to reduce the present burdensome surplus. To protect the grain carryover, improved inspection and fumigation procedures were outlined.

To provide adequate storage for anticipated increased production and needs in the future requires a long range storage plan. Rough estimates indicate adequate storage space exists at present with a reasonable carryover, however, within a few years space will not be adequate. A dynamic long range storage plan, in depth, should be prepared by an expert team. Of prime importance is the development of dependable statistics. Orderly expansion of storage depends on accurate definition of the exact amount of storage needed, where it should be located, when it should be built and cost of providing it. Once require-

ments are determined, storage can be promoted by means such as: (1) incentives offered to commercial storage operators to construct new storage space, preferably of the concrete or metal bulk silo type, (2) construction financed by maximum practical use of capital from the internal private sector, or (3) to the extent that the private sector does not respond to inducements. (such as guaranteed volume and duration of storage), the GOM should build large bulk bin annexes to existing SCAM storage elevators. The potential for increased farm storage should be evaluated by first determining losses occuring in present underground storage pits called "matmoras".

Study of opportunities for upgrading grain utilization are recommended, first, only in sufficient depth to determine whether opportunity exists and then, if indicated full feasibility studies for each. Areas to consider are: feed milling, wet corn milling (starch and sugar), alcohol production, and substitution of rye for wheat flour in breads.

Team findings and recommendations were made in a report entitled, "Review of Grain Storage, Handling and Distribution - Morocco 1969", Food Grain Drying, Storage, Handling, and Transportation Report No. 10, April 1969. Report distribution was as follows:

USAID/Morocco
Mr. Gaylord Walker
Food and Agriculture Officer - 20 copies
USAID/Washington
Dr. L. Stanley Peek, Bureau for Africa - 20 copies
Mr. Carl F. van Haeften WOH - 10 copies

E. INDIA - July 1969

USAID/India requested a consultant to supply technical assistance through the War on Hunger contract with Kansas State University, AID/csd-1588, "to introduce the subject of Grain Sanitation to India as a means of furthering technical interest and competence in grain protection".

The scope of technical services outlined, indicated the requirements of the consultant were, in general, as follows:

1. To lead a siminar on grain sanitation in cooperation with the Academy of Pest Control Sciences (APCS) and the Central Food Technological Research Institute (CFTRI), Mysore.

2. To recommend an agenda for the seminar workshop.

3. Provide laboratory and inspection worksheets for participants.

4. Present lectures and demonstrations on inspection and control techniques, laboratory analytical techniques, rodent and insect control, etc.

5. Visit representative Indian urban and rural grain handling and storage locations to observe grain losses due to rodents

6. Discuss rodent control with USAID officials.

In response to this request, the services of John R. Pedersen were offered through Kansas State University's contract, as a biologist-entomologist experienced in food plant sanitation, grain storage inspection and sanitation, laboratory testing of cereal grains for rodent and insect contamination and experience in presenting food sanitation workshops.

The grain sanitation workshop extended over a period of seven days and wss held at the Central Food Technological Research Institute at Mysore. There were 24 official participants from Indian industry, government and academic institutions in attendance. In addition, approximately 50-70 persons from several Southeast Asia countries attending other short courses were present at lecture sessions of the workshop. Although programming difficulties were encountered a meaningful workshop was conducted. Lectures illustrated with color slides were given on various aspects of grain sanitation. Laboratory exercises and demonstrations were presented to illustrated methods used in identification and isolation of grain contaminants. A laboratory manual, "Outlines of Grain Sanitation Inspection and Analysis", was prepared and provided for each of the workshop participants.

Facilities for the workshop were provided by CFTRI. Some of the lectures and laboratory sessions were presented by Mr. S. K. Majumder and his CFTRI personnel. In addition to the consultant, lectures and laboratory sessions were presented by Mr. Kenton L. Harris, USAID/India Biologist Rodent Control. Mr. Harris was also primarily responsible for the Grain Sanitation Workshop being undertaken.

In addition to the workshop, grain storage facilities were observed in urban and rural areas. Government grain storage facilities appear to be well maintained and managed. Grain observed in village markets and storage is not adequately protected from contamination by rodents, insects or birds. Grain and milled products at flour mills are subject to contamination and infestation by rodents, insects and birds from the time grain is received at the mill until the finished cereal product is shipped from the mill.

Rodent control aspects of grain sanitation were an integral part of the workshop, grain storage inspections,and discussions with USAID personnel.

Food Grain Drying Storage, Handling and Transportation Report No. 11, "Report on Grain Sanitation Workshop, July 7-12, 1969" discusses the workshop and includes copies of the agenda and laboratory manual used at the workshop.

Reports were distributed as follows:

USAID/India
- Agricultural Inputs Development (Plant Protection)- 20 copies

USAID/Washington
- Mr. O. L. Mimms, NESA/ID - 20 copies
- Mr. Carl F. van Haeften, WOH - 10 copies

## II. Foreign Non Travel Activities

### A. THE ENTENTE STATES AND GHANA - June 1969

At the request of Mr. Carl F. van Haeften, USAID/Washington, Office of the War on Hunger certain specified parts of an advance draft of "A Grain Stabilization Study of the Entente States and Ghana" March 1969, was reviewed. The study was prepared under the sponsorship of the Entente Council Fund by:

Weitz-Hettelsater Engineers
427 West 12th Street
Kansas City, Missouri 64105

and

Proter International Company
800 Seventeenth Street, N. W.
Washington, D.C. 20006

The study was reviewed by four individuals. Dr. L. Orlo Sorenson and Dr. Floyd F. Niernberger of the Department of Economics, Kansas State University and Dr. William J. Hoover and John R. Pedersen of the Food and Feed Grain Institute, Kansas State University.

Chapters VII through IX were reviewed and dealt with the (1) Buffer Stock Reserve Program, (2) Specific Recommendations for the Regional Buffer Stock Reserve Facilities and (3) Specific Recommendations for National Grain Storage Facilities.

An integrated system of grain storage and stocks management is proposed to help accomplish the following: (1) encourage increased grain production and increased commercial sales, (2) reduce cyclical fluctuations in supplies in the entire area and (3) reduce seasonal price variations.

Some of the proposals are questioned and in some instances the need for further study is indicated by those reviewing the report.

Copies of the comments prepared by the reviewers were sent in a letter to Mr. Carl F. van Haeften, USAID/Washington Office of the War on Hunger.

### B. ASIAN PRODUCTIVITY ORGANIZATION - December, 1968

Correspondence has continued with the Asian Productivity Organization regarding a proposed survey on the Problem of Storage and Transportation of Food Grains and a training course on Preservation and Distribution of Food Grains for member countries. Initial involvement in this matter began in November 1967.

It appears that the survey, in modified form from the original, has been initiated and undertaken without assistance from the Kansas State Contract.

The services of John Pedersen as an instructor for the basic part of the course dealing with grain quality, sanitation, drying and storage were offered. The training course, according to Mr. Chujiro Ozaki, Agricultural Programme Officer for APO, is to be held at the end of September 1969, and extend over a period of four weeks. Mr. Ozaki also has indicated that previous recommendations (Dr. W. J. Hoover's letter to Dr. Alvin A. Ayers, Office of the War on Hunger, USAID/Washington dated July 30, 1968) regarding content of the training course had been incorporated into his new training proposal.

Further action on this item is anticipated.

C. INDIA - June 1969

A request was received through the Office of the War on Hunger from USAID/India (TOAID A-326) for technical assistance regarding rice drying equipment.

An Indian manufacturer of heated air drying equipment had made a request to USAID/India for guidelines on design and manufacture of a medium sized (4-5 ton per hour) dryer unit for par-boiled rice.

It was considered beyond the scope of the Kansas State University contract (AID-csd 1588) to provide a design layout for a turn-key installation of a complete drying unit with accessory equipment. However, a selected bibliography on rice drying was prepared and forwarded to Mr. Carl F. van Haeften together with copies of selected technical papers dealing with various types of rice dryers. A copy of Food Grain Drying, Storage, Handling and Transportation Report No. 1 was also provided.

III. Domestic Activities

A. Travel and Conferences

1. Symposium on Biological Contamination of Grain and Animal By-Products. Minneapolis, Minnesota, February 17-18, 1969

John R. Pedersen attended the Symposium of Biological Contamination of Grain and Animal By-Products sponsored by the University of Minnesota in cooperation with the grain and feed industry.

The purpose of the symposium was to discuss the present status and potential future problems of insect and microbiological contamination of foods and feeds and interrelationships between insect and microbial contaminants.

Presentations were directed to management and operations personnel with speakers from industry, academic institutions, and from State and Federal agencies.

Basic background information on insects and microorganisms was presented early in the symposium. The basics were followed by a review of current laws and regulations. Industry responsibilities were also discussed. Potential

hazards of mycotoxins (mold produced toxins) were pointed out and their relationship to high moisture grain, cereal products and storage of grain and cereal products discussed. Some emphasis was placed on bacterial contamination (especially Salmonella) of feeds. The symposium concluded with a review of current research in the area of microbial contamination of grain and cereal products.

2. Senator Frank Carlson Symposium on World Population and Food Supply, Kansas State University, December 3-4, 1968

Dr. William J. Hoover, Director, Food and Feed Grain Institute, served as co-chairman of the symposium program committee. John R. Pedersen and other members of the team supplying technical assistance in grain storage attended the sumposium.

The symposium outlined the problems and discussed action programs and their significance. The caliber and content of the symposium is shown by the following list of subjects and speakers:

"Estimating Food Resources: Land and Productivity", Dr. Lester R. Brown, Administrator, United States Department of Agriculture, International Agricultural Development Service.

"Population and Food Supply: The Outlook for Man", Hon. George McGovern, U. S. Senator from North Dakota.

"Population Projections for the World's Regions: Pitfalls and Limitations". Dr. Milos Macura, Director, Population Division, United Nations.

"Projected Nutritional Needs: Quality vs. Quantity", Dr. Odgen C. Johnson, Chief, Domestic Unit, Nutrition Program, National Center for Chronic Desease Control, Department of Health, Education and Welfare.

"Projected Trends in International Trade in Food Production", Dr. John A. Schnittker, Under Secretary of Agriculture, Department of Agriculture.

"The Role of the University in Solving the World's Food and Population Problems", Dr. Eldon L. Johnson, Vice-president, University of Illinois.

"Family Planning and Population Control", Dr. Thomas K. Burch, Director Demographic Division, Center for Population Research, Georgetown University.

"The Technology of Population Control", Dr. Roy O. Greep, John Rock, Professor of Population Studies, Harvard University.

"Increasing Food Production", Dr. Erven J. Long, Director, AID Research and Institutional Grants.

"Food Storage, Handling and Distribution Systems for Developing Nations", Alden Ackels, Consultant.

"Industry's Role in Feeding the Hungry in the Developing Nations", Henry C. Frost President and General Manager, Corn Products Food Technology Institute.

"National Planning: The Relation Between Agricultural and Economic Development", Dr. John Mellor, Professor Agricultural Economics, New York State College of Agriculture, Cornell University.

3. Food and Drug Administration, Department of Health, Education and Welfare. Kansas City District, March 14, 1969.

On March 14, 1969, team entomologist John R. Pedersen visited the Food and Drug Administration District Office in Kansas City, Missouri.

The purpose of the visit was to up date knowledge on FDA methods, procedures and attitudes toward grain and cereal product contamination. Standards for levels of insect and rodent contamination of grain and cereal products were discussed.

B. Activities at Kansas State University

1. AID-USDA - Land-grant colleges and university cooperative short courses.

As a land-grant university, Kansas State University has cooperated with AID in hosting groups of individuals from developing nations during their participation in "Grain Storage and Marketing" short courses.

Although the visits are coordinated through the International Agricultural Programs office at Kansas State, much of the lecture, discussion and laboratory instruction given the participants comes from various departments (economics, engineering, entomology, grain science) and the Food and Feed Grain Institute within the University. A great majority of the persons who provide instruction for the participants have had overseas assignments either through the USAID contract to provide technical assistance in food grain drying, storage, handling and transportation or through other foreign assistance programs at the University.

Two such groups were hosted during the period reported here.

Participants were conducted on field trips to observe marketing, storage, drying, handling and transportation functions of the U.S. grain industry. In addition, they visited grain farms and had class room instruction in the various aspects of the grain industry. Project personnel participated in discussions of grain drying, storage, and pest control in stored grain. Basic biology and identification of stored product insects, microorganisms associated with stored food grains, and grain processing were also an integral part of the short course.

a. Grain Storage and Marketing, Special Course #31-- at Kansas State University, July 14-August 14, 1968

The objectives of the short course were to develop an understanding of farm and off-farm handling, storing, and marketing of grains with the aim of improving these operations in the participant's countries thereby reducing losses of food and increasing farm income.

Four countries were represented in this group of six participants. Their names, positions and addresses are listed on the following page.

Ali Akbar Jan
Extra Assistant Director of Agriculture, Peshawar
Department of Economics and Marketing
Government of West Pakistan, Lahore

Paulus Mukido Sudarsono
Chief, Budgeting Division,
Department of Plantations
Djakarta, Indonesia

Abdul Rashid Bin Mahmud
Agricultural Marketing Economist
Federal Agricultural Marketing Authority State Office
Kuala Trenggann, Malaysia

Mirza Aziz Beq
Extra Assistant Director of Agriculture, Multan
Department of Agriculture
Government of West Pakistan, Lahore

Moanga Mutemwa
Senior Marketing Inspector
Agricultural Rural Marketing Board
Lusaka, Zambia

Gibson Laston Mwale
Regional Marketing Supervisor
Agricultural Rural Marketing Board
Lusaka, Zambia

Technical leader for the group was Mr.
Dwight S. Tolle, Salina, Kansas

b. Grain and Marketing Program - Morocco--at Kansas State University, March 8-April 12, 1969.

The participant objectives of the short course were to (1) be introduced to the basic economic principles and market structure of the cereal and feed grain industry, (2) become familiar with different kinds of storage bins and equipment, (3) observe on-farm handling and storage of different grain crops, (4) learn how to control various physical problems of storage (including insects, rodents, and moisture), (5) become familiar with programs and services that government agencies and institutions furnish the grain farmer and grain industry (standardization, grading, and inspection; price support and incentive programs; credit and finance; research; market news and crop production information) and (6) learn basic principles of marketing agricultural products.

All of this group of eight participants were from Morocco. Their names and positions are listed below:

Ali B. Laheen Baadi
Bureau of Statistics
Beni Mellal, Morocco

Abdelaziz Benameur
Agricultural Credit (CNCA)
Rabat, Morocco

Abdezkader El Yaghmouri
Ministry of Agriculture (Rural Economy)
Rabat, Morocco

Brahim Balafrej
Head, Office of Exterior Commerce
Office Cherifien Interprofessionnel Cereales
Rabat, Morocco

Ransour Benmanjour Nejjai
Office Cherifien Interprofessionnel Cereales
Kenitra, Morocco

Radouane Boujema
Office Cherifien Interprofessionnel Cereales
Casablanca, Morocco

Ahmed El Jaomhari
Secretary General for the Commercial Division
Office Cherifien Interprofessionnel Cereales
Rabat, Morocco

Abderrohim El Ouardighi
Ministry of Agriculture
Rabat, Morocco

Technical leader for the group was Mr. Dwight S. Tolle of Salina, Kansas.

2. Other AID sponsored visitors

a. East Pakistan Elevator Managers Training Group
September 4, 1968.

Mr. Edward C. Brackney, Senior Engineer with Weitz-Hettelsater Engineers, 427 West 12th Street, Kansas City, Missouri 64105 escorted five men from East Pakistan to Kansas State University to visit the Department of Grain Science and Industry and to discuss grain elevator sanitation. These five men constitute an Elevator Managers Training Group in residence at Purdue University. Their training at Purdue is sponsored under a contract which Weitz-Hettelsater has with AID. Considerable time was spent discussing grain elevator sanitation and its importance in preventing grain losses due to deterioration, insects and rodents.

Participants in the group included:

Mr. M.F. Rabbi
c/o Mrs. M. D. Hardon
Court Para
Kushtia, East Pakistan

Mr. Maruf Morshed
31 Central Road
Kamalapur
Dacca-14, East Pakistan

Mr. Amir-E-Kabir Chowdhury
c/o Mr. Jahangir Kabir
EP. Hapda Quarter
Begunbari
Dacca-8, East Pakistan

Mr. Ekramul Hague
Silo Superintendent
16/ Abdul Gani Road
Dacca-2, East Pakistan

Mr. Keshat Lal Karmaker
Baleadhar
Abirpara
Noakhali, East Pakistan

b. Indian Grain Storage Officials, October 1968.

Three unaccompanied storage supervisors from India visited the Department of Grain Science and Industry and Department of Entomology to discuss the subject of food storage and pest control. John R. Pedersen spent a day with these visitors discussing storage conditions, methods and pest control in Indian warehouses.

The Indian visitors were:

J. K. Bidani
Senior Assistant Manager (Technical)
Food Corporation of India (New Delhi)
C.T.O. Buildings (I.A.R.I.)
New Delhi, India

H. J. Kakodkar
Assistant Director (Technical)
Office of the Regional Director (Food)
Mistry Bhavan
Dinshaw Wachha Street
Bombay-1, India

S. C. Majumder
Deputy Director (Technical)
Department of Food, Government of India
Office of the Regional Director (Food)
8 Esplanade East
Calcutta-1, India

c. Mr. S. K. Majumder, December 18-20, 1968.

Mr. S. K. Majumder, Chairman of the Infestation Control and Pesticides section at the Central Food Technological Research Institute, Mysore, India visited the Department of Grain Science and Industry and Department of Entomology for three days. During his visit he spoke to groups from the above departments, describing the operation of his section at C.F.T.R.I. and their current research. Members of the technical assistance team on grain storage, drying, handling and transportation discussed Indian farm, commercial and government grain storage methods and problems with Mr. Majumder.

d. Mr. John A. Hallam, March 20, 1969.

Mr. John Hallam is a British consultant to Asociacion Internacional de Desarrollo Cooperative - A.I.D. Projecto Agricola - Honduras. His visit to Kansas State and the technical assistance team was to clearly acquaint himself with our program for technical assistance in grain storage through A.I.D. and to explore means for closer cooperation.

3. Non-AID Sponsored Visitors.

In as much as Kansas State University is the main grain and feed processing instructional center in the United States, we are called upon to play host to many diverse groups and individuals from the U. S. and abroad who are interested in the grain and feed industries. Several such groups and individuals are listed below:

a. Italian Wheat Trade Mission Tour of the United States sponsored by Great Plains Wheat, Inc. and the Foreign Agriculture Service, U. S. Department of Agriculture, October 1968.

This group consisted of eight men who are executives in Italian flour mills and government food officials.

b. South Korean Wheat Mission sponsored by Western Wheat Associates and the Foreign Agriculture Service, U. S. Department of Agriculture, October 1968.

Six Korean flour mill executives and members of the Korea Flour Mills Industrial Association (K.O.F.M.I.A.) made up this group.

c. Japanese Flour Millers Industry Team sponsored by the Kansas Wheat Commission, November 1968.

The group was made up of five prominent Japanese Millers.

d. Rotary International Study Exchange Tour, March 27-27, 1969.

An Australian group of seven men visited under the sponsorship of Rotary International and Rotary District 571. Their visit placed special emphasis on agricultural research developments and relationships with government research programs.

e. German Wheat Trade Mission Tour of the United States sponsored by Great Plains Wheat, Inc. and Foreign Agriculture Service, U. S. Department of Agriculture, June 1969.

Four German milling executives were in this group.

f. Japanese Noodle Industry Team sponsored by Western Wheat Associates, Great Plains Wheat, Inc., and the Foreign Agricultural Service, U.S. Department of Agriculture, June 1969.

The eight men in this group were officers of the Japan Wet Noodle Manufacturers Association and the Japan Dry Noodle Association.

g. Individual Visitors included:

Dr. Robert W. Howe
Pest Infestation Laboratory
London Road
Slough, Bucks, England

Mr. Gordon F. Granger
Director of Manufacture and Quality Control
Maizena S. A. (affiliate of Corn Products)
Cali, Colombia

Mr. Masayoshi Yasuda
Chief Miller
Nisshina Flour Milling Co., Ltd.
Tokyo, Japan

Mr. J. Kawada
Assistant Director
Japan School of Baking
Tokyo, Japan

4. Continuing Programs

a. Information Retrieval System

We are continuing to build on our information retrieval system. The basic key word dictionary now consists of 302 key words or phases and is being modified periodically to meet specific needs.

b. Slide File for Training Purposes

New slides showing grain storage, drying, handling and marketing situations are continually being added to our file. The slides are in frequent use in association with the short courses at Kansas State University and were the primary source of visual aids used in the Grain Sanitation workshop held in India.

5. Report Distribution

No. 1. Rice Drying Technology and Equipment Which Might Be Applicable to Tropical Developing Countries. --176 copies (140 copies to the Library of Congress)

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| No. 2. | Brief Description for a Corn Handling Facility in Tropical Areas. | --28 copies |
| No. 3. | Structural Requirements of Grain Bins. | --29 copies |
| No. 4. | Report on Food Grain Storage, Marketing, Handling and Transportation in Jordan. | --69 copies |
| No. 5. | A Proposal to Equip Metal Silos in Jordan with Aeration and Temperature Monitoring Equipment. | --21 copies |
| No. 6. | Review of Grain Storage, Handling, Processing and Distribution Problems and Proposals in the Republic of Korea. | --13 copies |
| No. 7. | Assessment of Food Grain Storage Facilities, West Pakistan - 1968. | --90 copies |
| No. 8. | Implementation of Grain Storage Operations, Marketing Services and Price Stabilization in Honduras. | --80 copies |
| No. 9. | First Annual Report 1967-1968. | --33 copies |
| No. 10. | Review of Grain Storage Handling and Distribution-Morocco 1969. | --59 copies |
| No. 11. | Report on Grain Sanitation Workshop - July 7-12, 1969 Central Food Technological Research Institute Mysore, India. | --67 copies |