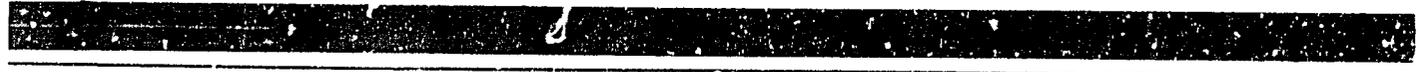


Grain Storage, Processing and Marketing



**KANSAS
STATE
UNIVERSITY**

**FOOD & FEED GRAIN INSTITUTE
MANHATTAN, KANSAS 66506**



ANNUAL REPORT

1979-1980

ANNUAL REPORT

Review of Activities
July 1, 1979 through June 30, 1980

Prepared for the
AGENCY FOR INTERNATIONAL DEVELOPMENT
UNITED STATES DEPARTMENT OF STATE

AID/ta-C-1162
Technical Assistance in Grain Storage, Processing, and Marketing
and Agri-business Development

at the

FOOD AND FEED GRAIN INSTITUTE
KANSAS STATE UNIVERSITY
MANHATTAN, KANSAS 66506

Dr. Charles W. Deyoe, Director

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ANNUAL REPORT

TECHNICAL ASSISTANCE IN GRAIN STORAGE, PROCESSING,
AND MARKETING AND AGRIBUSINESS DEVELOPMENT

AID/ta-C-1162

FOOD AND FEED GRAIN INSTITUTE
KANSAS STATE UNIVERSITY, MANHATTAN, KANSAS

In June 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 under the Contract, AID/csd-1588, entitled "Technical Assistance in Food Grain Drying, Storage, Handling and Transportation."

In September 1974, Kansas State University and the Agency for International Development agreed to a new Contract, AID/ta-C-1162 entitled, "Technical Assistance in Grain Storage, Processing, and Marketing and Agribusiness Development."

The current OBJECTIVES of the contract include the following:

1. To provide technical assistance to AID and cooperating countries, agencies and institutions in planning and implementing programs for more effective post-harvest handling, drying, conditioning, storage, transportation, marketing, processing and distribution of grains and grain products from field to final consumer as requested and authorized by AID. Services to be rendered by Kansas State University to AID and its cooperators will be tailored to the needs and resources of each recipient country.
2. To provide technical assistance to AID and cooperating countries, agencies and institutions in planning and implementing agribusiness development programs based upon feasible modular units in viable food chains extending from farm inputs through production, marketing and processing to final consumers as requested and authorized by AID. Services rendered will be tailored to the needs and resources of each recipient country.
3. To plan and execute general and specialized training in grain storage, marketing, processing, and in agribusiness development for AID and cooperating country, agency, and institution personnel and to prepare instructional, informational and reference publications and materials on the several administrative and technical aspects of grain storage, marketing, processing, and in agribusiness development for use by AID and cooperating countries, agencies and institutions and by the Contractor in its training activities. Training, publications and material will be tailored to the needs and resources of developing countries.

4. Develop methodology, establish criteria, and design systems and technology through adaptive and developmental research and exhaustive review of literature in pertinent fields to support the technical assistance and training objectives outlined in paragraphs 1, 2 and 3 above. Adaptive and developmental research will be tailored to the needs and resources of the developing countries.

A more detailed statement of the specific objectives can be found in the contract document.

IMPACT STATEMENT

The impact of a contract which encompasses activities as diversified as those of the KSU Food and Feed Grain Institute are difficult to assess. The success of short term technical assistance and training programs, as well as the developmental research projects, cannot be determined immediately nor can they be compared as instruments to increase food supplies. For example: Will better storage management in Costa Rica be more beneficial than improved rice marketing in Sierra Leone or more efficient wheat milling in Bolivia? Will development of a weather-resistant mud brick for construction of on-farm storage bins insure more food than development of regional food-security resources? Time and the circumstances of weather and politics may ultimately provide answers.

There is evidence that during this year, contract activities, in aggregate of all programs and projects, have made significant impacts on the developing countries we have aided. Policy-making persons in these countries now realize (1) the need for personnel of their own nation to be trained in technical and agribusiness aspects of post-harvest systems, and (2) the effectiveness of the "U.S. way" of teaching with hands-on experience whether in warehouse management, computerized market analysis, grain drying, or any of the many elements of post-harvest systems. Our ability to provide in-country training, as well as KSU short course instruction in Spanish and French, increases the effectiveness of assistance from the Institute.

In the past, governmental bodies have invited and encouraged foreign specialists to make recommendations, to develop projects and to train individuals for specific tasks. The programs have often failed after the specialists leave because there was neither trained management nor government support.

Evidence of this impact includes (1) increased requests for in-country, in-service training which will benefit the small farmer, (2) a request for in-country training of supervisory storage personnel in methods of teaching their own employees, and (3) increased number of persons financed by their own government sent to KSU for specialized training or advanced degrees in areas of post-harvest systems.

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REVIEW OF ACTIVITIES
July 1, 1979 through June 30, 1980

The following review summarizes Kansas State University's activities during fiscal year 1980 of its Contract, AID/ta-C-1162, which provided technical assistance in grain storage, processing, and marketing and agribusiness development in developing countries.

This report is organized under the following major areas of assistance:

- I. Assistance to USAID Missions and Host Countries
- II. Informational Services
- III. Training
- IV. Laboratory and Developmental Services
- V. Other Activities
- VI. Current List of Publications

I. TECHNICAL ASSISTANCE EFFORT

A. Technical Services Performed

AFRICA - Sierra Leone - December 1979

Nature of Activity At the request of the Government of Sierra Leone and USAID/Freetown, Cornelius Hugo, agricultural economist, and Dr. Kenneth L. Casavant, serving as KSU consultant, reviewed the capabilities to add rice to Sierra Leone Title I program and gave their recommendations.

The team was in Sierra Leone from December 2 through 23, 1979.

Objectives The following objectives were utilized by the team: (1) describe the present situation in Sierra Leone's rice sector; (2) evaluate the rice sector as to production, supply and demand; (3) review and evaluate rice marketing, policy and constraints on the rice sector; (4) recommend public and private improvements on the paddy and rice marketing system; (5) specify self-help measures to be included in any PL 480 Title I rice sales; (6) identify rice impact on producer incentives of PL 480 Title I rice sales; and (7) recommend whether PL 480 Title I sales in 1980 to Sierra Leone should include rice.

Summary of Activities Initial work activities were discussed with AID Mission personnel regarding scope of work, background material relating to scope of work and general economic environment of the country. A review of available literature, studies and data was undertaken. This allowed development of an informal questionnaire and alternative hypothesis relative to scope of work and objectives.

The hypotheses were examined and refined by interviews with relevant government authorities. An up-country visit to Njala, Kenema, Bo, Torma Bum, Port Loko, Rokupr and Makeni and four native villages allowed further testing.

The study team analyzed and evaluated the qualitative and quantitative data and a draft of the conclusions and recommendations was left with USAID/Freetown.

Reporting and Distribution Observations and recommendations of the team are recorded in Technical Assistance Report No. 80, "Assessment of the Need, Impact, and Proposed Uses of PL 480 Title I Rice Sales to Sierra Leone," December 1979 of the Grain Storage, Processing and Marketing series.

AFRICA - Senegal - March 1980

Nature of Activity In following up a request for grain storage training in June 1978, Ken Steinke, graduate of KSU's Grain Science Department accepted a position through the AID Mission in Dakar and AID/Washington to work in Senegal. His position is as Technical Advisor in Grain Storage to ONCAD (Office National de Cooperation et d'Assistance pour le Développement).

Upon approval of AID/Washington, Mr. Steinke returned to KSU to assist in designing a Training of Trainers Short Course. His TDY was in Manhattan, Kansas from March 7 through 23 when he left to return to Dakar.

Objectives The tropical climatic conditions which exist in Senegal tend to favor post-harvest grain losses. The two distinct seasons (the dry season from Mid-November to mid-June and the rainy season from June to October) and the progressive increase in rainfall from north to south provides a variety of conditions under which grains may be stored.

Post-harvest losses due to high moisture and molds can be a problem especially in the rice producing areas and in other grains produced in the southern regions of Senegal. There is a need for improved drying techniques.

Increased efforts to store large quantities of grains over extended periods of time to ease the effects of drought and other causes of food shortage present situations which can result in large scale losses.

ONCAD has recognized the importance of improved central warehousing of cereal grains and has a program to provide improved storage conditions in Senegal. Part of that program is to provide sound storage facilities for millet, sorghum and other cereal grains. An integral part of this program is to train personnel in the proper techniques for preserving the quality of grains in storage.

With these factors in mind, Mr. Steinke and the Food and Feed Grain Institute staff worked to develop a Training of Trainers Short Course to be conducted in the fall of 1980.

The goals of the course will include providing basic background information on the preservation of cereal grains during storage to a corps of individuals who will use this knowledge in conjunction with their own understanding of the conditions in Senegal to train warehouse managers and workers; quality agents and fumigators; and secco managers.

Reporting and Distribution A training manual entitled, "Cours d'entraînement sur La Conservation des Grains et La Gestion du Stockage" will be developed for use in the in-country short course.

ASIA - Philippines - November/December 1979

Nature of Activity Upon request from Southeast Asia Cooperative Post-harvest Research and Development Programme (SEARCA) and approval of ATD/Washington, a two-member team traveled to Manila to provide assistance in training.

Dr. Valerie Wright, Grain Storage Entomologist, and Mrs. Rosemary Burroughs, Mycologist, traveled to the Philippines November 20 through December 2, 1979.

Objective The objective of this travel was to backstop Food and Feed Grain Institute staff member, Norman Teter, by giving instruction in mold and mycotoxin contamination of food grains.

Summary of Activities Instruction was given to participants of the "Training Course on Post-harvest Prevention of Waste and Loss of Food Grains." Forty-six participants from 12 countries attended the course developed by the SEARCA technical team with the Asian Productivity Organization (APO), Productivity and Development Center, National Grain Authority (Philippines) and SEARCA as sponsoring agencies. Participants were funded by the APO and the Royal Netherlands Government.

The mycological portion of the 3-week course included 2 days of lecture and laboratory plus preparation and reading of plated material. The class sessions were held a week apart to allow students to plate-out rough rice and corn kernels from previously prepared experimental storage at the first session and to observe and interpret the results at the second. A demonstration was given on the black-light screening technique for aflatoxin in corn. Suggestions for the sessions on mold damage to cereals in future courses were made to the SEARCA team members.

Other Activities In-field observation of rice culture and harvesting was made in Central Luzon. Year-round rice cultivation is practical where there are irrigation systems.

The team toured NGA rice buying, milling and storage facility at Cabatuan City. Instruction in warehouse sanitation is badly needed.

They also visited the University of the Philippines at Los Banos (UPLB) and talked with faculty members about grain storage problems involving insects and fungi as well as visiting the SEARCA headquarters.

A tour of the International Rice Research Institute (IRRI) was taken and possibilities of consideration of post-harvest problem by IRRI were discussed. A visit was made to Central Luzon State University (CLSU) at Munoz to observe and photograph the food technology and rice and feed milling buildings under construction as part of KSU/CLSU contract. Also contacted KSU faculty members

serving as program advisors.

Reporting and Distribution A trip report was filed with AID/Washington, Project Manager's Office.

ASIA - Philippines - December 1979/January 1980

Nature of Activity At the request of officials of the International Rice Research Institute and approval of AID/Washington to travel under contract, Miss Zenaida F. Toquero, graduate research assistant, returned to the Philippines under an IRRI fellowship. Miss Toquero traveled on December 13, 1979 and returned to KSU on January 24, 1980.

Objective The objective of this trip was to complete the collection and tabulation of the remaining IRRI primary data on the quantitative and qualitative losses in rice in alternate post-harvest technology.

Summary of Activities Dr. Bart Duff, Head of the Economic Section of the Department of Agricultural Engineering, IRRI, assigned a research assistant and two student assistants to assist in the collection and tabulation of data generated from the farm and mill level trials conducted in the Bicol region.

Follow-up surveys in the pilot areas included in the post-harvest field trials were also conducted. The major objective of this follow-up survey is to evaluate the impact of alternate post-harvest technologies with regard to some established parameters such as technical and economic efficiency, social acceptability and local adoptability, employment patterns and labor wages, income distribution, price incentives and other related factors. Due to time constraint, the survey was split between Miss Toquero and the research assistant with the latter surveying the Central Luzon pilot areas and Ms. Toquero surveying the Bicol region. Follow-up survey was conducted simultaneously from January 3 through 6, 1980.

Preliminary results of the follow-up survey indicate the increasing popularity of the IRRI-designed axial-flow thresher both in Central Luzon and the Bicol region. This wide acceptance for mechanical threshing was attributed to the timeliness of operation, ease and convenience of performing the threshing job, grain loss reduction, effective consolidation and control of the threshing output, and the ability of the machine to thresh even wet paddy.

Interviewed farmers in the Bicol region claimed mechanical threshing enables the harvester and threshers to work on more plots thus increasing their total share of the harvest. Mechanical threshing saved a lot of labor so local farmers need not import or hire harvesters and threshers from nearby towns and villages and they consider this a benefit especially during peak months of harvest when there is labor shortage. They believe the sector most adversely affected by the introduction of mechanical threshers and the consequent reduction in the labor force are the small store owners who make big money during the harvesting months from the sale of meals and snacks for these transient and local harvesters and threshers.

Contrary to the popularity of the threshers, the twin-bed batch dryers were not very popular in the study areas. This was attributed to the rising cost of fuel and oil. The problem was further aggravated by the presence of cemented pavement which enabled the majority of farmers to dry their paddy using solar energy. This practice did not entail any "out-of-pocket" costs except for their labor. The reluctance to use the mechanical dryer was also due to the lack of suitable price and quality incentives for properly dried paddy.

Additional Activities Zenaida also made contacts with people involved in projects related to rice post-harvest technology including the SEARCA Post-harvest Advisory Team of Drs. Dante de Pauda, Norman C. Teter and Don Russell. Dr. de Padua is the Technical Team Leader of the group and the Director General of the National Post-Harvest Institute for Research and Extension (NAPHIRE), an agency created in May 1978. The NAPHIRE's main objective is to accelerate research and development, manpower training and extension aspects of the post-production sector of the grains industry. In its organizational stage, NAPHIRE leans heavily on the National Grains Authority (a government agency responsible for the grains industry especially rice and corn) not only for physical and financial resources but also guidance in the development of its programs and work plans. Some proposed projects to be initiated this year under a World Bank loan include the following:

1. "Post-harvest Loss Assessment" aimed to quantify on-farm post-harvest losses for different harvesting practices and conditions.
2. "The Development of the Socio-Economic Systems at the Village Level to Allow the Utilization of Post-production Technology and Equipment" which will undertake a benchmark socio-economic survey of selected pilot areas to establish the actual and existing physical and economic environment (this study will be done cooperatively with agricultural state universities and colleges in selected rice growing areas of the country).
3. "Product and By-Product Development and Utilization" which will look at profitable utilization of damaged and fermented paddy and milled rice and the utilization of rice hull and straw as a source of energy for milling and other commercial processing operations.
4. "Handling and Transport System" which will determine the requirements for successful bulk storage and handling of grain in the context of small farm production and the tropical environment.

The office of the National Grains Authority (Manila) was visited to check some of the results of the laboratory analysis they have made for the paddy and rice samples collected in the farm and mill level field trials.

Miss Toquero, on her last day in IRRI, presented a seminar on her research work, some of the preliminary findings and future plans for the analysis of the data. The seminar was attended by the Departmental Research Staff (economists and engineers), some of the SEARCA staff and other research workers who are conducting work in rice post-harvest technology.

On January 22, Miss Toquero traveled to Berkeley, California and visited the Western Regional Research Center of the USDA. Dr. Albert Mossman, Chemist of the Cereal Products Unit of the Center gave her a brief tour of the research laboratory facilities and introduced her to some of the staff. Notes and research experiences were exchanged with the Economist, Dr. Robert Enochian, and the Engineer, Dr. William Schultz, involved in the post-harvest research project. Dr. Enochian discussed feasibility studies on the costs of establishing rice bran processing plants and experiences in India. Dr. Mossman showed her a copy of the Bibliography that he and Dr. Robin Saunders have compiled on studies in rice post-harvest technology. A final copy of the Bibliography will be sent once it is ready for circulation.

Reporting and Distribution A trip report was completed and filed with the Project Manager, AID/Washington.

ASIA - India - January through March 1980

Nature of Activity The Government of India (GOI) through the AID/Delhi Mission requested technical assistance on their Rajasthan (state) Medium Irrigation Project. Dr. Richard Phillips, Agricultural Economist, traveled to India January 7 and returned March 3, 1980 in partial response to this request.

Dr. Roe Borsdorf, Agricultural Economist, joined Dr. Phillips in India on February 15 and returned to the U.S. on March 23, 1980.

Objectives This TDY included assisting with economic evaluation of the Rajasthan Medium Irrigation Projects as well as assisting with preparation of the Project Paper to permit final evaluation of the project for AID financial support.

Irrigated agriculture is well established throughout India and has been for many years. Major, medium and minor irrigation projects continue to receive priority emphasis in Indian state and national budgets. AID is now supporting a medium irrigation program in Gujarat; if approved, the Rajasthan program will be the second.

Summary of Activities The Rajasthan Medium Irrigation Project is not one project, but a whole series of candidate subprojects, each of which has unique characteristics and constraints. For this reason, AID project evaluation is being done on the basis of prototype subprojects, and recommended guidelines are being developed for specific evaluation of each additional candidate.

Following the Statement of Work, the team ended their TDY having completed the following:

1. Project Paper Economic Analysis: Essentially completed as planned for the three prototype subprojects -- Gosunda, Morel, and Gudha. Economic measures calculated include Direct Rate of Return (using projected real farm gate prices), Associated Rate of Return (measuring economic impact), Social (total) Rate of Return and Economic Rate of Return (using simulated "free market" world prices). All of these analyses provide the accompanying Net Present Values and fully-discounted Benefit-Cost Ratios at alternative discount rates. In addition, sensitivity analyses were made to test the impact of various project parameters on the economic viability of the prototypes. Forty sensitivity runs were made.

On the basis of the results from these, seven more are to be run at KSU and the results supplied to the Mission. The additional seven are formulated to assist AID to determine how to advise GOR (Government of Rajasthan) and GOI in sound redesign of certain prototype subprojects to enhance their economic viability.

2. Project Paper Beneficiary Analysis: This analysis was completed using subproject-wide cropping patterns, yields and transitions appropriate for each category of irrigated agriculture (surface irrigation only, surface plus well irrigation, rainfed agriculture), cropping season and level of project input to be provided. Farm budgets were developed to show the anticipated impact on "average" farmers (and landless laborers) in each relevant farm size and income grouping for that subproject. More detailed beneficiary analysis would require more complete data than now available to GOR. However, if time had permitted, sensitivity analysis could have been made to test the probable impact of other parameters outlined in Item 2 of the Statement of Work.

3. Computerized Project Economics: The MPJ and IRR computer programs used by KSU are operational at Delhi University and Indian Agricultural Research Institute. These programs are user-controlled. The IRR program was used to test the sensitivity of project viability to relevant parameters for the three prototype subprojects.

Present operational constraints of computer services potentially available to GOR seriously limit the usefulness of these programs as on-going tools for the Rajasthan Medium Irrigation Project. No computer facilities nor terminals are now available in Rajasthan to GOR project engineers, agriculturalists or economists. The services currently available in New Delhi are unreliable. Plans are underway to enhance the services at Delhi University, but this will take time to bring to fruition -- probably two years or more. The 24 or 48-hour turn-around time at Pusa makes that facility useful primarily for complete runs only, such as the final discounted cash flow and sensitivity analysis for each subproject. Modifications in the MPJ Fortran program will be needed to make feasible the computer generation of project benefit schedules, farm impact budgets, etc. by GOR staff, either at Pusa or Delhi University. The existing MPJ is a versatile program requiring substantial user interaction; the needed modifications would tailor and standardize it to the specific needs for Rajasthan Medium Irrigation subproject. Such a modified version would require prior systematic hand analysis and input preparation, as discussed in item (4), below.

4. Training: Because of conditions found when the specialists arrived in India and Rajasthan, this item of the plan of work was modified. The project evaluation training provided to GOR analysts during the TDY was on-the-job rather than in the form of seminars or workshops. The key people with major responsibilities in project evaluation were interested and receptive. With them, the major future needs for technical assistance and training on project evaluation were identified. These were incorporated into a proposed plan and preliminary budget for Mission Director Bowden to present personally to AID/W.

Major components of the proposed technical assistance and training in project evaluation for GOR personnel, if the Rajasthan Medium Irrigation Project is approved, include the following:

- Development of a revised Manual of Procedures for the Water Utilization Cell of the GOR Department of Agriculture, incorporating detailed guidelines, standardized work tables and "easy-flow" sequential steps of analysis. This step will require TDY technical assistance to Rajasthan.
- Specialized non-degree training in computerized procedures of project evaluation in the USA for a limited number of key GOR staff (2 or 3 people only). The training should be selected carefully to insure that it is tailored to the needs of LDC personnel; proven training that has been developed and conducted successfully in the past, such as that offered by IBRD and by the KSU Food and Feed Grain Institute, should be given priority consideration. Normally the needed training requires 9 to 12 weeks and should be planned so that participants can use Rajasthan subproject candidates as laboratory "cases" for the training.
- In-country training for GOR staff analysts, based on the revised Manual of Procedures and the U.S. training of key professionals.
- Follow-up technical assistance and in-country training to tailor the computer programs and train local staff in their use.

Reporting and Distribution A trip report combining the team's efforts was forwarded to the AID Project Manager, Washington, D. C.

ASIA - Korea/Malaysia/Singapore - January/February 1980

Nature of Activity Through invitation of the SEARCA staff and approval of AID/Washington, Drs. Do Sup Chung and Paul A. Seib traveled to Korea, Malaysia and Singapore to give technical assistance and information as requested. The team left Manhattan on January 19 and returned February 7, 1980.

Objectives To attend and present technical papers at the 1980 Grain Post-Harvest Workshop in Kuala Lumpur, Malaysia; to participate in follow up on previous short courses and a seminar as well as review a joint research project on rice drying and milling in Korea; to observe grain storage and wheat processing plants in Korea and Singapore.

Summary of Activities Malaysia--"Spoilage of Rough Rice Measured by Evolution of Carbon-Dioxide" and "A Natural Convectional Dryer for On-Farm Use" were the technical papers presented at the Workshop held in Kuala Lumpur. The workshop program included the presentation and discussion of twenty-eight research papers related to post-harvest systems, storage, drying and rice milling. Over 70 participants and observers from Malaysia, Indonesia, Philippines, Thailand, United States, United Kingdom, Canada, Korea, Japan, India, Bangladesh, Australia, FAO, USAID/Indonesia and SEARCA Technical Team members attended the workshop.

Singapore--The trip purpose was to observe wheat processing plants, namely, flour mill and noodle manufacturing, in order to obtain information on noodles and noodle making processes. More than 50% of the wheat imported by many

Asian countries is being used to produce noodles. In spite of their popularity, noodles and noodle-making processes have not been studied in detail by scientists. We often receive inquiries on technical information regarding these processes from Asian countries.

Korea--Met with several individuals in the Ministry of Agriculture and Fisheries (MAF) who participated in the Grain Storage and Drying Short Course (in-country) and Grain Reserve System Seminar. As a result of the 1979 short course, MAF is contemplating holding a similar type of short course in 1980 for food grain facility managers and inspectors at various provincial locations.

Met with Mr. S. N. Cho, Director-General Project Evaluation Division, Economic Planning Bureau, and discussed activities of the Computer Application for Project Evaluation Short Course participants. We met with several of the participants and learned that the materials learned at the short course are already being applied for evaluating specific projects proposed in Korea.

Discussed a proposed memorandum of understanding between KREI and Food and Feed Grain Institute with Mr. B. H. Kim, President and Dr. D. H. Kim, Vice President, KREI. This memorandum was submitted in order to establish cooperative and collaborative research on agricultural marketing, transportation and systems analysis of mutual interest to both institutions.

Dr. E. N. Lee, Dean of Seoul National University's College of Agriculture, was visited and discussions were held on various training programs and research projects.

The team met with Drs. C. J. Chung, H. K. Koh and K. H. Ryu and discussed teaching and research activities. Dr. In K. Han, coordinator of the Feed Manufacturing Technology Short Course in 1979 at SNU, indicated that a positive impact on the Korean feed industry has been seen resulting from the short course.

Dr. S. K. Hahn, Director of Agricultural Machinery Institute, MAF, discussed various research programs on harvesting and in the post-harvest areas.

Field trips were taken to IPI, Daejon, Suweon and Incheon to observe grain storage facilities, feed mills, flour mill and noodle manufacturing companies.

Reporting and Distribution A trip report was sent to the Project Manager, AID/Washington.

ASIA - Philippines/Indonesia - June 1980

Nature of Activity Dr. Charles W. Deyoe, Director of the Food and Feed Grain Institute, traveled to the Philippines and Indonesia to attend administrative meetings regarding SEARCA activities. He traveled June 15 through 30.

Objectives Dr. Deyoe's objectives included meeting with Norman C. Teter, Agricultural Engineer, stationed with SEARCA in Manila, Philippines under Contract AID/ta-C-1162 to discuss future plans in Mr. Teter's work. The meeting in Indonesia was with the SEARCA Advisory Board on present and future projects.

LATIN AMERICA - Bolivia - July 1979

Nature of Activity The Government of Bolivia through the USAID/La Paz Mission requested a team to evaluate milling and storage capacities at government mills. Dr. Dale Eustace, Milling Engineer, and Mr. Carl Reed, Storage Specialist, traveled to Bolivia July 7 through 28, 1979 to supply this assistance.

Background: Since the revolution of the early 1950's disrupted the production and marketing of wheat, the Republic of Bolivia has relied on imports of flour from the U.S., Argentina, Brazil, and Europe to meet the major portion of its consumption requirements. In 1978, Bolivia consumed about 190,000 M.T. of flour. The year before, flour imports--mostly from Argentina--totaled 123,000 M.T. (grain equivalent).

Recently, the GOB reached an agreement with the Bolivian Association of Milling Industries (ADIM) whereby flour imports were reduced and wheat imports increased as the industry increased its milling capacity. The flour imports were to be stopped in 1979.

As a result of this agreement, many mills that had been largely unused for nearly thirty years were renovated. Most of the existing mills have been, or are now being expanded. Three mills have recently been constructed.

This expansion has increased capacity to more than the domestic demand for flour, and since the GOB imports only enough wheat to meet the domestic consumption requirements, mills must now function at considerably less than full capacity for lack of wheat. Both wheat and flour prices are fixed by the GOB, so millers must rely solely on volume of sales to generate enough profits to survive. Thus the competition for the limited supply of wheat is extremely keen.

The Association (ADIM) distributes imported wheat among the mills on the basis of the milling capacity of each such that a mill which contributes say, 10 percent of the total national milling capacity receives 10 percent of the yearly imports of wheat.

Objective The K.S.U. team was given the role of "referee" among the millers, and charged with the accurate and impartial measurement of the milling and storage capacity of each mill. This information will, hopefully, provide the basis for a fair and functional plan of wheat allotment in Bolivia.

Summary of Activities Meetings were held with AID personnel and the President of the ADIM. Field trips were taken to visit 17 mills. The survey conclusions are as follows.

Milling capacities were determined by considering factors such as centimeters of roll surface, square meters of sifting surface, flow diagram of the mill, type of equipment used, grinding and sifting efficiency, age of the mill, and feed rate. Some items have general parameters as a guide while others depend upon the skill and experience of the person making the survey.

For the grain (wheat) storage capacity, a factor of .77 metric tons per cubic meter was used. This is equivalent to 60 pounds per bushel, which is the standard measure used in the sale of wheat in the U.S. No factor of compaction nor increase in test weight due to handling or drying was used. Calculated capacity was typically about 10 percent less than the capacity claimed by the millers.

A meeting with the president of ADIM was attended as well as a meeting with the AID/Mission personnel.

Reporting and Distribution A final report was written and translated and given to officials of ADIM. A trip report was filed with DSB/AGR, Washington, D. C. with the Project Manager.

LATIN AMERICA - Costa Rica - August 1979

Nature of Activity At the request of the University of Costa Rica through the AID Mission in San Jose, a team was sent to San Jose to conduct a Grain Storage Management Training Short Course for Consejo Nacional Produccion (CNP) personnel.

The team consisted of Dr. Robert Mills, Entomologist; Mr. Carl Stevens, Storage Engineer; and Mr. Carl Reed, Post-harvest Loss Specialist. Dr. Ted Granovsky, Entomologist, was hired as a consultant to assist the team in the short course training. Assistance was also supplied by Dr. Miguel Mora, KSU graduate from Costa Rica.

Mr. Reed traveled on August 16 with Dr. Mills and Mr. Stevens traveling on the 18th. Dr. Granovsky was currently in Costa Rica. All members of the 3-man KSU team had returned to Manhattan by August 30.

Objectives The CNP buys grain (maize, rice, sorghum, and beans) for the purpose of stabilizing prices. A major problem is transportation of the grain to CNP facilities soon enough to dry it before mold damage occurs. Also, field infestation of stored grain insects are a concern.

The main objective of this TDY was to provide training for 14 employees of CNP. The participants in the short course were attentive and appeared interested in improving their knowledge of grain storage. One of their concerns is how to train the employees at their CNP facilities.

CNP needs assistance in developing a training program for their employees, in sanitation (including use of chemicals) and in elevator and warehouse operation and maintenance.

Since CNP buys much of its grain directly from larger farms, they are not as directly concerned about the grain which goes into the small, private grain storage and marketing facilities. There seems to be a lack of knowledge about conditions of the grain in these places. A survey should be made of the situations throughout the country at the farmer and small grain dealer levels. The

mold-damaged and insect-infested grain observed in the market at Cartagos indicated that much grain is not being handled satisfactorily.

Summary of Activities The CNP Facility at Barranca was visited by Drs. Mills, Granovsky and Mora. Observations at this facility were mostly favorable. The facility is a complex composed of grain storage and drying; a seed testing, cleaning, and storage facility; and a salt-iodizing plant.

The grain storage section is in two parts, one with 33 metal silos of ca. 1000 metric tons each and the other with 6 large corrugated metal silos. There were more than 100 employees at the site with about 70 in the grain handling and storage part.

Due to additions and modifications over the 25 years since the original structures were built, there is a variety of conveyor and dryer systems. It is modern and, except for residues of grain and dust in conveying equipment and on structural braces of the building structure, relatively well maintained.

The warehouses were empty and clean. They were not rodent-proof, but we were told that rodents were not a serious problem: rat fecal pellets were observed at the seed handling facility.

The Barranca facility was free of insects; birds could enter the elevator structures and pigeons and grackles were observed around and in the buildings.

There was no opportunity to visit smaller warehouses or other types of storage facilities, which are not likely to be modern and as well maintained as the central CNP facilities.

The La China facility was visited by Mr. Stevens and observations there were also favorable. The facility was 2 years old and well maintained. Mr. Morales, Head of Quality Control, appeared to be a very conscientious individual who was very familiar with maintenance and operational procedures.

The La China facility consisted of several large (approximately 1000 tons each) steel storage bins, some within bin dryers. They also had two separate dryers. They were using No. 2 fuel oil for fuel.

Reporting and Distribution A trip report, detailing the day-to-day training, was filed with the Project Manager, DSB/AGR, Washington, D. C.

LATIN AMERICA - Costa Rica - December 1979

Nature of Activity Following a request from the Government of Costa Rica and CARE through the AID Mission in La Paz, Drs. Harvey Kiser and Ekramul Haque traveled to San Jose from December 9 through 20, 1979.

Objectives There were two objectives in this TDY. They include:

- I. A feasibility study for converting the present bagged grain storage and handling system to a bulk system, which includes:

- the economic consequences of converting from a bagged to a bulk system
- storage capacity requirements
- equipment requirements
- estimated equipment and installation costs
- space and design requirements.

II. A post-harvest soybean system assessment providing:

- recommendations for improved handling, storage and market procedures
- recommendations as to the establishment of procurement norms and procedures (including a grading system)
- estimations of economic costs for the above interventions.

Summary of Activities Mr. Justin Jackson, Director of CARE, arranged meetings with appropriate government officials and technical personnel. Two days were spent in the Guanacaste province observing the fields of soybeans in the CARE Project. While in Guanacaste, the team observed the harvesting of soybeans and the National Production Council (CNP) facilities at Liberia, where the harvested soybeans would be delivered. The first field of beans harvested yielded 42.7 quintals (100 pounds) per hectare (28.8 bushels per acre). Not all fields will yield this but the estimated average yield for the 172 planted hectares was 25 quintals per hectare (16.9 bushels per acre).

CARE's Low-cost Extrusion and Cooking Plant in San Jose was visited three times and the Plant Manager, Mr. Harry Muir conducted the meetings. The proposed bulk storage and handling system would be installed at this plant.

Meetings were held with additional staff of CARE (Soya Project), CNP, Central Bank of Costa Rica, USAID staff, manufactureres of bin and grain handling equipment, IICA, Ministry of Economy Industry and Commerce and a farmer participating in the soybean project. Other contacts were made to collect data by phone. The National Meteorological Institute of Costa Rica was visited.

During the team's trip to Guanacaste, they visited the CNP seed handling and storage plant in Barranca and the farm storage, handling, and drying system owned by Mr. Charles Girling.

Observations from this TDY included:

- At this stage, it seems feasible to build a bulk storage and handling system at the LEC plant site.
- Preliminary analysis indicates that the savings from establishing a bulk handling and storage system will justify an installation.
- To assess the post-harvest soybean system, recommendations for soybeans alone cannot be made without considering the relationships that exist between soybeans and other grains.
- The Government of Costa Rica has a set of procurement standards for rice, corn, beans, and sorghum. CARE has incorporated similar procurement norms for soybeans in its contracts with the participating farmers. Both GOCR and CARE

have established a set of discounts based on these norms or standards. This practice is an important part of establishing an efficient marketing system.

Reporting and Distribution A trip report was completed and filed with the Project Manager, DSB/AGR, Washington, D. C. Six copies of the feasibility study were forwarded to Mr. Justin Jackson, Director of CARE, for presentation to the Government of Costa Rica.

LATTN AMERICA - Bolivia - January 1980

Nature of Activity The USAID/La Paz Mission requested that the Food and Feed Grain Institute, under their technical assistance Contract AID/ta-C-1162, initiate a short course in Flour Milling for the Bolivia Millers Association.

Dr. Robert E. Julian, Coordinator of the Institute, and Mr. Cornelius Hugo, Agricultural Economist acting as translator and assistant, traveled to La Paz January 19 and returned from the TDY on January 25 to follow up the request.

Objective The original request for training was received by the USAID Office of Rural Development in La Paz from the Ministry of Industry for a Flour Milling Seminar which was to include participants from both the Ministry and the Millers Association. The purpose was to improve the monitoring capabilities of the Ministry and to improve the efficiency of the milling operations.

According to Sr. Gonzalo Escobari, Gerente, Asociacion Industriales Molineros, there are 16 wheat mills actively operating in Bolivia within the Association. Six mills have foreign and/or locally trained millers in charge of production. Apparently the employment of the foreign technicians is very costly to the companies. The other 10 mills employ self-trained millers who have learned their profession on the job without formal training.

Background: In a meeting with Sr. Muñoz, PL 480 Executive Secretary, discussions were held on the responsibilities of the PL 480 office relative to the monitoring of the PL 480 Title III program. The activities of the present program were initiated in March 1979. In the present Title III program, the GOB 5-year plan will involve 14 projects; 12 in agriculture and 2 in health.

The PL 480 program calls for delivery of 240,000 MT wheat in 1979 and 278,000 MT in 1980. At present, the GOB is receiving 25,000 to 30,000 MT of wheat per month. All wheat is delivered to the 16 private mills under a GOB contract for processing and dispersion to the markets.

At present, the major problems have been connected with transportation from two receiving ports in Chile with the primary port being Port Antofagastia. Neither of the two ports have protected storage for incoming grains; therefore, the grain may remain on outside concrete slabs from 1 to 2 weeks' time prior to being transported by rail to Bolivia. At present, there is a railcar shortage but plans are being made for the Millers Association to purchase 200 railcars which will later be transferred to the GOB. Storage facilities were not discussed.

At present, there seems to be sufficient milling capacity of approximately 450,000 MT (16 mills) to handle the yearly projected 300,000 MT consumption. It was felt that a training program would be beneficial in establishing a more efficient operation.

Summary of Activities There was an interest in Ministry personnel to also participate in the training, specifically regarding inspection and monitoring. It was indicated that four participants might be sent to the KSU on-campus 1980 Latin American Milling Short Course (May 23 through June 9), two being financed by the Ministry and two by the Millers Association. It was strongly felt that an in-country short course also would be most beneficial and would involve those that need the training most. It was requested that the course be given at the earliest possible time. Because of current commitments, KSU could not initiate the requested training until the fall of 1980. Though the Millers Association had not requested the training, they would welcome the opportunity to participate.

It was estimated that 20 people would participate in the in-country short course with at least one representative from each of the 16 mills. It was suggested by the attending PL 480 representative that the Ministry of Industry, because of their involvement in wheat milling regulatory activities, would wish to include three participants in the short course.

Sr. Ferrari, owner of the Ferrari-Ghezzi y Cia mill located at Oruro, agreed to the possibility of using his mill as the location for training. It was indicated by Sr. Escobari that Oruro would have facilities to accommodate the participants and trainers. The mill, built in 1972, has a capacity of 180 MT/day on two operation lines of 60 MT and 120 MT, respectively.

It is anticipated that up to four participants may be sent to the KSU Latin American Milling Short Course in May 1980.

In further discussions with Sr. Muñoz, a lack of trained personnel was indicated in the area of storage management and practices, as well as marketing related issues. The KSU Grain Storage and Marketing Short Course, offered June 16 through August 1, 1980, would provide excellent training to meet the need of grain storage and marketing requirements under the PL 480 Title II Program.

Discussions were held with Mr. Harry Wing, USAID/La Paz Economist, regarding future marketing studies of cereal grains (corn, rice, barley and wheat). Such studies will serve as necessary input for the "Markettown" projects to be started during fiscal year 1982. Also, the information derived from such studies can be used by the Executive Secretaria of PL 480 Title III to determine future locations, sizes, etc. of storage facilities as well as required personnel development under the 5-year plan. Future possible technical assistance to be provided by KSU was discussed.

An informal meeting with Maura Bean, USDA Western Region Research Lab representative, gave excellent information on Ministry of Industry quality control. Ms. Bean, who has been working with laboratory personnel regarding tests of fortified wheat flour, feels that a great amount of lab procedural training is needed before any type of accurate quality control can be expected. This is the same lab that monitors flour quality of the 16 mills. She feels that sending these people to the KSU Latin American Milling Short Course would be excellent training with a few days added for some training in laboratory analysis work with flour.

Reporting and Distribution Upon their return, the team filed a trip report with the Project Manager, DSB/AGR, Washington, D. C.

B. Follow up on Previous Overseas Requests

LATIN AMERICA - Honduras

Nature of Activity As a result of KSU technical assistance provided by Drs. Richard Phillips and Paul Kelley, Agricultural Economists, during the period March 6 through 19, 1979, the Government of Honduras through USAID/Tegucigalpa requested additional technical assistance.

Dr. Richard Phillips accompanied by Mr. Cornelius Hugo, Agricultural Economist, traveled to Tegucigalpa April 21 through May 2, 1980.

Objective The objective of this TDY was to assist in a project review as requested by IHMA (Instituto Hondureño de Mercadeo Agrícola).

Reporting and Distribution A report on the team's findings was drafted and filed with IHMA.

C. Potential Areas for Technical Assistance

1. AFRICA

a. Senegal - An in-country Training of Trainers Short Course is planned for the fall of 1980 following additional planning sessions held in March 1980 at KSU with Ken Steinke, Technical Advisor in Grain Storage, ONCAD, Dakar, Senegal.

2. LATIN AMERICA

a. Bolivia - Tentative plans for an in-country Flour Milling Short Course have been made following a technical assistance request in January 1980.

D. Long-term Technical Assistance in Philippines

Mr. Norman Teter, Agricultural Engineer, continues to serve as a team member of the multi-national post-harvest technical group. He is headquartered at the South-east Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), University of Philippines, Los Baños. The team works throughout the South-east Asian area identifying post-harvest technology problems. Mr. Teter is serving in the Philippines under Contract AID/ta-C-1162.

Included in the activities of Mr. Teter are the following:

- Taught at the Regional Post Harvest training course, financed by the Netherlands Government. The course was held at Los Baños in July/August and was attended by 40 participants from Thailand, Malaysia, Indonesia and the Philippines. Several students were previously enrolled in drying and storage short courses.

- attended "International Conference on Agricultural Engineering for National Development" in Malaysia September 1979 and presented a paper.
- writing of text material for IPB graduate course which will be taught (October quarter) at IPB, Bogor.
- assisted in the third annual Grains Post-Harvest Workshop in Kuala Lumpur January 29-31, 1980 with 36 foreign and 32 Malaysian observers/participants. The theme was "Grain Quality Improvement."
- Dr. Valerie Wright and Ms. Rosemary Burroughs assisted in "Training Course on Post-harvest Prevention of Waste and Loss of Food Grains." The course was attended by 46 participants from 12 countries. The KSU-based team gave excellent instruction in mold and mycotoxin contamination of food grains.
- participated/led a Milled Rice Storage Seminar in Singapore January 21-22, 1980.
- lectured in the Development Bank of the Philippines Seminar attended by 35 participants in March 1980.
- served as guest lecturer for San Pablo area NGA, lectured on storage (May 1980).
- worked with Southeast Asia Exchange of Experiences and Practices in May/June 1980.
- visited VISCA, Baybay, Leyte, Philippines to become acquainted with post-harvest operations of the Philippines Root Crops Research and Training Center.

Technical assistance was given on problems of corn drying/handling; cassava processing; construction and expansion of private mill in regard to storage/handling and aeration problems among others.

II. INFORMATIONAL SERVICES

As a part of the technical assistance provided under Contract AID/ta-C-1162, project staff members reply to numerous requests for information on specific items. Some of the requests come directly through or from USAID Missions in host countries. Other requests come directly to staff members at Kansas State University, either as a result of assistance we have provided under USAID sponsorship or through personal professional contacts. In many cases, the requests for information can be answered by sending reports or other printed materials prepared under the contract.

A. Post-Harvest Documentation Service (PHDS)

In its second year of operation, the Postharvest Documentation Service (PHDS) placed emphasis on informing developing country researchers of documents collected during 1978-1979 on all phases of postharvest storage, processing and marketing of cereal grains, and disseminating these documents for their use. This dissemination was accomplished through the use of brochures, news articles, conferences and presentations.

Brochures--An information packet, including document and search request forms, was completed and sent to over 80 USAID Missions in developing countries. The packet was also made available to developing country researchers and organizations upon request. Presently, PHDS is designing a revised, two-color brochure in English, French and Spanish for distribution to several hundred addresses provided by USAID and the National Academy of Sciences.

News Articles--Articles about PHDS appeared in the following publications: (a) USAID Resources Report; (b) A Directory of Information Resources in the United States, National Referral Center, Washington, D. C.; (c) Agricultural Libraries Information Notes, NAL; (d) News from the Food and Feed Grain Institute; (e) Repertory of Information Sources External to the Sahel, Sahel Institute, Mali; (f) State Library Directory of Special Libraries and Resources in Kansas; (h) Feedstuffs; (i) Post-Harvest Quarterly, SEARCA, Philippines; and (j) Quarterly Bulletin of the International Association of Agricultural Librarians and Documentalists.

Conferences--Attending conferences such as Online '79 in Atlanta, Georgia and Kansas Library Association meetings provided another means of informing researchers about PHDS. The most beneficial meeting attended was in Washington, D.C., at which time the PHDS Coordinator met with personnel from USAID, National Agricultural Library, USDA and the National Academy of Sciences. Contacts made at those meetings have proven extremely beneficial to PHDS operations.

Presentations--Presentations were given to the Food and Feed Grain Institute staff, a USAID Evaluation Team, a group of USAID interns and the 1980 KSU Grain Storage and Marketing Short Course participants. PHDS services were discussed, information packets distributed and samples displayed of microfiche and acquisitions lists produced by the service.

During the past year, the dissemination efforts of PHDS resulted in the distribution of information as follows:

<u>Item</u>	<u>Total</u>
Information Brochures	110 Countries
Acquisitions List Subscribers	171
USAID Missions	India
Australia	Italy
Canada	Netherlands
Costa Rica	Philippines
Denmark	Thailand
El Salvador	United Kingdom
France	United States
Ghana	West Germany
Computerized Searches Requested	33
Document Copies Requested	744
Total Acquisitions (June 1980)	2,000

B. Technical Information Requests

Brazil - Information on natural convectional dryers was sent in reply to a request.

Kenya - Gary Lewis - requested information on feeding out-of-condition grain.

Korea - Information on natural convectional dryers was sent in reply to a request.

FAO/Rome - Information on natural convectional dryers was sent in reply to a request.

USA - VITA, Washington, D. C. requested information on rice milling techniques and nutritive values of by-products.

Senegal - AAPC, New York, New York requested information for Government of Senegal on Cyanogas foot pump duster and gasoline powered duster.

Pakistan - Muhammad Z. Khan, Embassy of Pakistan, Washington, D.C. requested information on fumigation and termite proofing.

Korea - Dr. I. K. Hahn requested information on feed manufacturing and feed storage facilities.

Korea - Dr. Doyle Jeon requested information on Institute activities and possible cooperative research.

C. Visitors Under USAID Sponsorship and Others

1. AFRICA

- a. Tunisia (September 1979)
Staff members discussed storage problems with a 6-member Tunisian Wheat Trade Team.
- b. Nigeria/Syria/Iraqi/Italy (October 1979)
Staff member discussed grain storage and preservation with 9-member Mid-East/Africa Grain Team.

2. ASIA

- a. Philippines (August 1979)
Professor Moises Sardido, University of Philippines at Los Baños visited with staff members on international grain marketing and storage problems.
- b. Korea (September 1979)
Dr. Dong Hi Kim, Vice President of Korea Rural Economic Institute (KREI) visited with staff members and reviewed and discussed Food and Feed Grain Institute activities and the development of the Food Reserve System.
- c. Korea (October 1979)
Staff member discussed mill sanitation with a five member Flour Processor Team; another staff member discussed storage facility problems with the team.
- d. Korea (October 1979)
Staff members discussed grain storage and preservation with a six-member Korean Wet Corn Millers Team.
- e. Japan (December 1979)
Staff member discussed grain storage and preservation with three-member Japanese Wheat Team.
- f. Korea (December 1979)
Dr. Y. K. Yang, Professor of Food Science Department, Korea University, met with staff member and discussed Institute activities.
- g. Korea (March 1980)
Dr. Han-Chul Yang, Professor of Korea University and Mr. Rho, Director of Research and Development Division, NongShim Cereal Processing Company met with Institute staff members and observed and discussed grain processing activities.
- h. Korea (May 1980)
Mr. Bo-Hyun Kim, President and Mr. Soo-Yeon Lee, Administrative Assistant of Korea Rural Economic Research Institute (KREI) met

with Institute staff members to review and observe activities and discuss cooperative agreement between the two Institutes.

- i. Philippines (May 1980)
Staff members visited with five-member Pesticide Team and discussed stored grain insect control and pesticide laws.
- j. Taiwan (June 12-13, 1980)
Dr. S. C. Wung, Director of Animal Industry Research Institute, Taiwan Sugar Corporation met with staff members and discussed the Food and Feed Grain Institute's activities and developmental services.

3. LATIN AMERICA

- a. Honduras (August 1979)
Ing. Julio Ustariz, Vice Director General, IHMA; Arturo Mejia, Director of Finance and José Samro, Chief of Operations met with Institute staff to present and discuss commodity flow through U.S. marketing channels and farm programs; discussed training program on international grains markets and marketing management.
- b. Paraguay (May 5, 1980)
Ing. Nelson de Barros, Director of International Agriculture visited with staff members concerning training and technical assistance programs.

4. NEAR EAST

- a. Jordan (August 1979)
The Jordanian Wheat Trade Commission Team met with staff members to discuss wheat marketing and storage problems.
- b. India (October 18, 1979)
Dr. P. C. Bansode, Dr. S. D. Mane and Dr. S. E. Pawar visited with staff members in regard to stored-grain insect problems.
- c. Lebanon (November 1979)
Staff member discussed grain storage and preservation problems with 4-member Lebanese Wheat Trade Mission Team.
- d. India (May 1980)
Mr. G. E. Thierstein, ICRISAT, met with staff members to review Institute activities.
- e. Pakistan (May 1980)
Staff member visited with six-member Wheat Team and discussed grain storage and pest control.

5. EUROPE

- a. West Germany (October 1979)
Staff member discussed grain storage and preservation with 6-member Wheat Team.
- b. Denmark (March 21, 1980)
Mr. Arne Moller of Agri Contact visited with staff members on grain storage and preservation problems and engineering research.

6. NEW ZEALAND

Mr. and Mrs. Arthur Mulholland met with staff members and discussed commodity flow of U.S. grains in marketing channels and the farm program.

7. UNITED STATES

Institute staff members met with Mr. Tim O'Hare of AID/DSB/AGR, Washington, D. C. and 10 IDI (International Development Interns) on March 24-25, 1980. Discussions were held on the Institute's activities and organization/structure and individual meetings were set up to enable the interns to become better acquainted with the individual staff members.

Dr. Robert Morris, AID/DS/Washington, D. C. met with the Institute staff April 8-9, 1980. Discussions were held on the Institute activities which included organization/structure, scope of activities, Post-Harvest Documentation Service, and developmental services.

D. Requests for Institute Reports Prepared under this Contract

Included are Technical Assistance Reports (TR), Research Reports (RR), and Special Reports (SR).

<u>Location</u>	<u>Number of Requestors</u>	<u>Reports Requested</u>		
		<u>TR</u>	<u>RR</u>	<u>SR</u>
AFRICA				
Ethiopia	1			1
Kenya	3	1	2	2
Nigeria	3	3	3	
Swaziland	2			2
Tanzania	7			7
Upper Volta	5			5
ASIA				
Indonesia	1	1	2	
Korea	18	2		16
Malaysia	1			1
Philippines	3	7	6	3
Taiwan	1	9	7	1
EUROPE				
Austria	1	2	1	
England	4	18	5	4
France	2	3	1	2
Italy	1	3	1	1
Netherlands	1	3	1	1
LATIN AMERICA				
Bolivia	1	3		
Costa Rica	3		1	3
Dominican Republic	1	1	2	2
Honduras	1			5
Uruguay	1		1	
NEAR EAST-SOUTH ASIA				
India	2	2	1	1
Nepal	1		3	
Sri Lanka	1	1		
Turkey	1			1
Yemen	3			3
CANADA				
	6	14	1	8
UNITED STATES				
Commercial	5	8	3	1
Government	16	37	22	12
KSU				
Ag. Econ Teaching				66*
Faculty-Staff	27	119	28	29
Libraries		8	4	3
Universities	16	18	1	9

*User's Guide to Computerized System for Feasible Agribusiness Development, Vol. I Text and Charts, Vol. II Computer Programs.

III. TRAINING PROGRAMS

Observations made by project staff members while on overseas assignments continue to indicate the need for increased technical training of various types. The technical training provided under this contract is considered to be one of the most significant contributions of the contract. Training provides a foundation on which the developing countries can rely in self-resolution of technical problems related to storage, processing and marketing.

A variety of types of training are possible under this contract and some training has been utilized as shown in previous technical assistance assignments. The on-campus AID Grain Storage and Marketing Short Course, held each year at Kansas State University, continues to be the main training effort under the contract.

Other on-campus training includes degree program training and special training programs for AID sponsored participants. In addition, project staff members have taken part in two special training programs: (a) Romanian Milling Short Course under the International Grains Program for 1 week in March 1980 with 5 participants in attendance and (b) Latin America Short Course, held from June 25, 1980 and continuing through July 5, 1980 for 23 participants.

Training provided in conjunction with Contract AID/ta-C-1162 is discussed in greater detail in the following paragraphs.

A. AID Grain Storage and Marketing Short Course - 1979

The ninth annual AID Grain Storage and Marketing Short Course was held June 18 through August 4, 1979.

One week's orientation in Washington, D. C. was provided by the USDA/AID International Training Office. Seven weeks of intensive lecture, discussion, laboratory, workshop and field trip training was provided on the Kansas State University campus June 18 through August 3, 1979.

Based on the previous years' recommendations in participant evaluations, attempts were made to provide greater depth of instruction in the economic and technical aspects for participants interested in these specific areas. A core of subject material for all participants included the following subject areas: Structure of cereal grains; Grain inspection; Standards and grading; Moisture and its measurement; Causes of losses; Microflora and chemical, physical and nutritive changes; Pest control; Methods, equipment and structures for drying, aerating and handling of stored grains; Principles of management and operation; Storage costs and alternatives; Bookkeeping and inventory control; Transportation and Government in marketing.

The technical group received expanded training in the areas of: Moisture measurement; Microflora; Insect identification; Biology and methods of detecting contamination; Rodent and bird biology; Pest control--inspection, house-keeping, physical and mechanical methods; Insecticides and fumigation practices;

Grain drying and aeration; Storage structure design; and Grain grading and inspection practices. During the course training, two evaluation questionnaires were given the technical group to determine if the training was being understood.

The economic group received expanded training in the areas of: Facilitating marketing operations; Analysis of the marketing system; Organization of the grain business; Government involvement in grain marketing; Grain transportation planning; Master projection of grain data; and Feasibility analysis of grain projects.

The approach, in the past, seems to work quite well in that the group is split between the technical and economic groups based on participant preference.

A change was made in the 1-week field trip this year. Accompanied by four KSU staff members (and one wife), the group began the trip on July 15 by traveling to the Kansas City area to observe grain storage facility manufacturing, river storage facilities and the Board of Trade marketing functions. The group then traveled to Stuttgart, Arkansas to visit the Rice Branch Experiment Station and a food cooperative. They observed rice production, storage, handling and processing facilities and toured a soybean processing plant. The group continued on to New Orleans, Louisiana where they toured elevators, port facilities and observed sacking operations. Literature was provided in addition to the tours.

The 1979 Short Course included 24 participants from 9 countries including Costa Rica (1), Ethiopia (1), Korea (4, including interpreter), Philippines (1), Swaziland (2), Taiwan (1), Tanzania (7), Upper Volta (5), and Yemen (3).

"Participant Country Reports" continue to be an effective way of getting participants actively involved in discussing their individual country grain storage and marketing systems and problems. It is extremely important for the participants to be able to look at their own storage and marketing situations and evaluate them from the standpoint of strong and weak links in the total marketing chain. We have had some difficulty in providing "Participant Country Information Summary" manuals to participants before they depart their home countries for the Short Course. The manuals are provided to assist the participants in gathering pertinent data on their countries' storage and marketing systems. Unfortunately, we are not receiving notification of which missions are sending participants with enough lead time so that manuals can be sent. Participants without the benefit of the manual are at somewhat of a disadvantage in presenting their "country reports" and in certain other workshop activities.

This year a questionnaire, supplied by the USDA Training Office, was completed by each participant at the end of the 7 weeks' intensive training at KSU. A summary of responses to the written questionnaire is as follows:

1979 Short Course
Economic and Technical Groups

I. PERSONAL DATA

1. Sponsorship AID 14 FAO 0 Joint Commission 0 Other 5
2. Are you participating in any other training in the U. S. in addition to this course? YES (5) NO (13)
3. Please list your primary professional (or educational) field. _____
Management-5, Marketing-2, Food Science-1, Engineer-1, International Law-1
Middle School-1, Agent in cereal office-1
4. Please indicate the highest academic level you have achieved.
B.S.(5);M.S.(1);Ph.D.(0); If other degree, please list:Diploma-4
16 years-1; 13 years-1; D.U.T.-1; C.E.C.-1; M.B.A.-1
5. Please indicate if you were in Economic Group I 7
or in Technical Group II 13.

II. ENROLLMENT AND ORIENTATION

1. Before enrolling in the seminar, did you have sufficient information available to decide whether or not you wanted to attend? YES (12) NO (8)
2. Were the objectives of the program clear to you before you began the seminar? YES (19) NO (1)
3. Were the financial arrangements for the course clear to you before you began the seminar? YES (14) NO (6)
4. Do you have any comments or suggestions on the enrollment of participants for this course?
Be better informed beforehand; early information on country reports, extend the short course to more than six months; inform of details in advance; would like data for country reports, need clearer objectives and know what materials to bring; languages limited to 2 at a time (including English)
5. How helpful was the Washington International Center orientation?
Not at all Somewhat Very useful Did not attend
1 2 (1) 3 (2) 4 5 (8) (10)
6. How helpful was the USDA orientation in Washington?
Not at all Somewhat Very useful Did not receive
1 2 3 (4) 4 5 (6) (11)
7. What comments or suggestions do you have for the orientation segment of the course?
OK; satisfactory, need a detailed explanation, then ask for comments; the orientation must be clear according to the course in addition to the difference in traditions; time should be increased. The two training sessions allowed me to learn much about Am. agriculture--I will be glad to apply them at home; it was good to give a general idea to what we would find in the U.S.

III. TRAINING ENVIRONMENT AND SUPPORT ARRANGEMENTS

1. How adequate were the following arrangements?

	Not at all	Adequate	Very good
Training facilities	()	(7)	(14)
Housing accommodations	()	(9)	(11)
Meals	(1)	(13)	(6)
Transportation	()	(6)	(16)
Field trip arrangements	()	(7)	(15)
Social activities	()	(14)	(6)

If you feel any of the arrangements were inadequate, please suggest how they might be improved. inform the food center dietician and workers the different religious traditions. Problem with food habits; hotel prices excessive

2. Do you consider that the daily schedule was generally

1 too short; 14 about right; 7 too long

3. Was the rest and break time

3 too short; 18 about right; 1 too long

IV. TRAINING OBJECTIVES

Below are the training objectives for this course. Please circle the number which indicates the degree to which you feel that each training objective was achieved.

To increase knowledge and skills in	Objective Not Achieved		Objective Partially Achieved		Objective Fully Achieved
a. Grain storage, handling, drying, and sanitation	1	2	3 (7)	4 (6)	5 (9)

If you did not fully achieve this objective, what do you think might have enabled you to do so? was best for time limit; needed to talk about flat

warehouse; time was too short; tuition time needs to be extended by about

3 to 4 months; a longer training session; there were some translation problems, if possible require the participants to take English before the course.

	Objective Not Achieved		Objective Partially Achieved		Objective Fully Achieved
b. Grain marketing and grain loss problems	1	2	3 (8)	4 (6)	5 (9)

If you did not fully achieve this objective, what do you think might have enabled you to do so? more time needed; need more practical work; specialization in grain marketing and grain storage from the first day of course;

in our country there is not sufficient food to go around, so the problem of losses is important

c. Grain inspection and grading	1 (1)	2	3 (6)	4 (11)	5 (3)
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If you did not fully achieve this objective, what do you think might have enabled you to do so? need more time; need practical and real work; course is very interesting but in our country there is not quality difference, the important thing is quantity; should go more in depth

d. Handling and marketing firms	1	2	3 (4)	4 (15)	5 (2)
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If you did not fully achieve this objective, what do you think might have enabled you to do so? need practical work; time is too short; course is very useful

e. Economic principles of marketing and organization of small and large firms	1	2 (4)	3 (3)	4 (10)	5 (2)
---	---	----------	----------	-----------	----------

If you did not fully achieve this objective, what do you think might have enabled you to do so? time is too short; since I was in the technical group we weren't able to take the economic course and I think we should have been given a better introduction to the economics; cases were of developed countries, what about developing countries or the cases of each participant country

V. COURSE ACTIVITIES

Please rate the usefulness of the following course activities by circling a number on the scale and rate the amount of time devoted to them by placing a check in the appropriate space.

	<u>Usefulness</u>					<u>Amount of Time</u>		
	<u>Not useful</u>		<u>Very useful</u>			<u>Too little</u>	<u>About right</u>	<u>Too much</u>
a. Structure of Cereal Grains I & II	1	2	3 ₍₄₎	4 ₍₃₎	5 ₍₁₄₎	(3)	(17)	(1)
Comments: <u>more time needed; very good presentation; good</u>								
b. Chemical, Nutritive and Physical Changes in Storage I & II	1	2	3 ₍₃₎	4 ₍₁₅₎	5 ₍₁₃₎	(3)	(18)	()
Comments: <u>more time needed; good</u>								
c. Moisture Measurement I & II	1	2	3 ₍₃₎	4 ₍₂₎	5 ₍₁₆₎	(4)	(14)	(2)
Comments: <u>need practical work; need more time; good</u>								
d. Microflora I & II	1	2	3 ₍₂₎	4 ₍₆₎	5 ₍₁₂₎	(6)	(14)	()
Comments: <u>time too short; more lab work needed; good</u>								
e. Mold-Moisture Relationships I & II	1	2	3 ₍₁₎	4 ₍₅₎	5 ₍₁₅₎	(3)	(17)	()
Comments: <u>more time needed; interesting</u>								
f. Grain Standards I & II	1	2	3 ₍₂₎	4 ₍₁₃₎	5 ₍₇₎	(3)	(16)	()
Comments: <u>practical work needed; time too short; good</u>								
g. Grain Grading I & II	1	2	3 ₍₅₎	4 ₍₅₎	5 ₍₁₁₎	(3)	(17)	(2)
Comments: <u>practical work needed; interesting; time too short</u>								
h. Grain Handling Equipment I & II	1	2	3 ₍₂₎	4 ₍₄₎	5 ₍₁₅₎	(4)	(15)	(1)
Comments: <u>too much to cover; time too short</u>								
i. Methods of Handling Grain I & II	1	2	3 ₍₂₎	4 ₍₃₎	5 ₍₁₅₎	(2)	(15)	(2)
Comments: <u>time too short</u>								

	<u>Usefulness</u>					<u>Amount of Time</u>		
	<u>Not useful</u>		<u>Very useful</u>			<u>Too little</u>	<u>About right</u>	<u>Too much</u>
j. Types of Storage Structures I & II	1	2	3	4 ₍₄₎	5 ₍₁₈₎	(4)	(13)	(2)
Comments:	too many lectures; want more work; would like to have discussed low cost types of structures and a combination of both bulk and local facilities; need more time to understand this							
k. Aeration of Grain I & II	1	2	3	4 ₍₇₎	5 ₍₁₅₎	(5)	(11)	(3)
Comments:	too much time spent; need more time							
l. Grain Drying I & II	1	2	3 ₍₂₎	4 ₍₅₎	5 ₍₁₄₎	(4)	(12)	(2)
Comments:	too much time spent; need more time							
m. Causes of Grain Losses I & II	1	2	3 ₍₂₎	4 ₍₁₎	5 ₍₁₈₎	(4)	(14)	()
Comments:	more instruction needed; more time needed							
n. Sanitation and Pest Control I & II	1	2	3	4 ₍₁₎	5 ₍₁₈₎	(5)	(12)	(1)
Comments:	more time needed							
o. Insect Identification and Biology II	1	2	3	4 ₍₁₎	5 ₍₁₄₎	(5)	(9)	()
Comments:	enough time; need more time							
p. Methods of detecting contamination in Grain II	1	2	3 ₍₁₎	4 ₍₄₎	5 ₍₁₀₎	(2)	(12)	()
Comments:	interesting; more time needed; very interesting							
q. Sanitation: Inspection & Housekeeping II	1	2 ₍₁₎	3	4 ₍₃₎	5 ₍₁₂₎	(2)	(12)	(1)
Comments:	more time needed; very interesting							
r. Physical and Mechanical Methods of Pest Control II	1	2	3	4 ₍₃₎	5 ₍₁₂₎	(1)	(14)	()
Comments:	need more practical work; time too short; very interesting							
s. Insecticides II	1	2	3	4 ₍₂₎	5 ₍₁₂₎	(1)	(13)	()
Comments:	need to know how to dilute insecticides; time too short; very good							

	<u>Usefulness</u>					<u>Amount of Time</u>		
	<u>Not useful</u>			<u>Very useful</u>		<u>Too little</u>	<u>About right</u>	<u>Too much</u>
t. Fumigation II	1	2	3 ₍₁₎	4 ₍₁₎	5 ₍₁₃₎	(2)	(13)	()
Comments: <u>time too short; very interesting</u>								
u. Fumigation Safety II	1	2	3 ₍₁₎	4 ₍₁₎	5 ₍₁₄₎	(2)	(13)	()
Comments: <u>time too short; very interesting</u>								
v. Rodent Control II	1	2	3	4 ₍₃₎	5 ₍₁₂₎	(1)	(13)	()
Comments: <u>time too short; very interesting</u>								
w. Storage Methods and Procedures I & II	1	2	3	4 ₍₅₎	5 ₍₁₄₎	(4)	(13)	()
Comments: <u>time too short; very interesting</u>								
x. Storage Costs and Alternatives I & II	1	2	3 ₍₁₎	4 ₍₆₎	5 ₍₉₎	(6)	(6)	(1)
Comments: <u>time too short; very interesting</u>								
y. Principles of Management I & II	1	2	3 ₍₂₎	4 ₍₁₀₎	5 ₍₉₎	(4)	(13)	(2)
Comments: <u>time was too short for technical group to grasp economics</u>								
z. Principles of Operation I & II	1	2	3 ₍₁₎	4 ₍₁₁₎	5 ₍₈₎	(5)	(11)	(2)
Comments: _____								
aa. Organization of the Grain Business I	1	2	3 ₍₁₎	4 ₍₈₎	5 ₍₈₎	(4)	(8)	(3)
Comments: <u>time too short</u>								
bb. Bookkeeping, Accounting and Inventory Control I & II	1	2 ₍₁₎	3 ₍₂₎	4 ₍₁₀₎	5 ₍₆₎	(5)	(12)	(2)
Comments: <u>I didn't get anything out of this</u>								
cc. Transportation I & II	1	2	3 ₍₁₎	4 ₍₁₁₎	5 ₍₉₎	(5)	(11)	(1)
Comments: <u>not enough time--I studied these things in school and I wanted to increase my knowledge, but the time was too limited</u>								

	<u>Usefulness</u>					<u>Amount of Time</u>		
	<u>Not useful</u>		<u>Very useful</u>			<u>Too little</u>	<u>About right</u>	<u>Too much</u>
dd. Facilitating Market Operations I	1	2	3	4 ₍₃₎	5 ₍₄₎	(2)	(3)	(1)
Comments:	_____							
ee. Analysis of Marketing Systems I	1	2	3	4 ₍₂₎	5 ₍₅₎	(1)	(4)	(1)
Comments:	_____							
ff. Data Preparation I	1	2	3	4 ₍₃₎	5 ₍₃₎	(3)	(2)	(1)
Comments:	_____							
gg. Feasibility Analysis of Grain Projects I	1	2	3	4 ₍₂₎	5 ₍₅₎	(3)	(2)	(1)
Comments:	_____							
hh. Master Projections of Grain Data I	1	2	3	4 ₍₃₎	5 ₍₃₎	(2)	(3)	()
Comments:	_____							
ii. Sizing Facilities and Equipment I & II	1	2	3 ₍₃₎	4 ₍₉₎	5 ₍₄₎	(2)	(12)	(1)
Comments:	_____							

Overall, how would you rate the effectiveness of classroom instruction?

Poor

Excellent

1

2₍₁₎

3

4₍₅₎

5₍₁₂₎

Comments: needs to be extended by three months; Congratulations to all! The course is very short, but nonetheless interesting; this allowed me to learn many things which I will apply and practice at home for a better future. I wish to thank the professors and tell them good luck and keep up the good work.

<u>Field Trips</u>	<u>Usefulness</u>					<u>Amount of Time</u>		
	<u>Not useful</u>			<u>Very useful</u>		<u>Too little</u>	<u>About right</u>	<u>Too much</u>
a. Farmland Industries	1	2	3 ₍₃₎	4 ₍₁₁₎	5 ₍₈₎	(2)	(17)	(2)
Comments: <u>see more important things; saw nothing of interest to me</u>								
b. Board of Trade	1	2 ₍₁₎	3 ₍₃₎	4 ₍₈₎	5 ₍₁₀₎	(5)	(16)	()
Comments: <u>no time; didn't understand</u>								
c. Stuttgart Rice Experiment Station	1	2	3 ₍₃₎	4 ₍₉₎	5 ₍₁₀₎	(3)	(16)	(2)
Comments: _____								
d. LSU Dryer	1	2	3 ₍₄₎	4 ₍₁₁₎	5 ₍₇₎	(7)	(10)	(1)
Comments: <u>no efficiency; time too short</u>								
e. Grain Elevator	1	2	3	4 ₍₈₎	5 ₍₁₇₎	(1)	(17)	(3)
Comments: <u>seem too many of the same thing</u>								
f. Port Inspection Station and Port	1	2	3 ₍₁₎	4 ₍₄₎	5 ₍₁₇₎	(2)	(18)	()
Comments: _____								

Please rate the overall effectiveness of the field trip.

Poor				Excellent
1	2	3 ₍₂₎	4 ₍₇₎	5 ₍₁₃₎

Comments: well organized--banquets to the organizer; no problems; the success of such trips depends on the subject of the course and the professional knowledge of the participants

VI. The Instructors

Please rate the overall effectiveness of the following individuals:

	<u>Poor</u>			<u>Excellent</u>
a. Ernie Gutierrez (technical leader)	1	2	3 ₍₁₎	4 ₍₂₎ 5 ₍₁₇₎

Comments: a good group leader; very helpful; could not have been better; helped a lot; he is active and projective despite his age; a man of good will, very understanding and talented old man, may God grant him a long life; very competent--never tires of helping us; always jovial; kind, helpful, does his job well

- | | <u>Poor</u> | | | | <u>Excellent</u> |
|---|-------------|---|---|-----|------------------|
| b. Professors at Kansas State University | 1 | 2 | 3 | (1) | 4 (4) 5 (17) |
| <p>Comments: <u>they did their best to help us; no problems with the profs--the</u>
 <u>were always helpful and kind; always understandable; always happy</u>
 <u>and smiling; patience is their finest virtue and that is what makes a good</u>
 <u>course; thanks for the explanations and may they live to teach others in</u>
 <u>the world the many things we have learned</u></p> | | | | | |
| c. Interpreters | 1 | 2 | 3 | 4 | (2) 5 (5) |
| <p>Comments: <u>Misson-1, 3, 3, 3, 4; Foster-4, 4, 4, 4, 4; Porter-1, 1, 2,</u>
 <u>2, 4; Kirsdi-5, 5, 5, 5, 5 (These are personal evaluations)</u></p> | | | | | |
| d. Please list those instructors who should definitely be included in next year's program. | | | | | |
| <p><u>All - 10; Pedersen - 7 (very interesting); Borsdorf - 6; Hugo - 0;</u>
 <u>Acasio - 5; Chung - 4; Reed - 3; Stevens - 2; Mills - 1; Burroughs - 4;</u>
 <u>USDA Staff - 1</u></p> | | | | | |

VII. THE INSTRUCTION

1. Please rate the following aspects of the instruction:

	<u>Good</u>	<u>Average</u>	<u>Poor</u>	<u>Comment</u>
<u>Quality of instruction</u>	(21)	()	()	()
<u>Methods of instruction</u>	(16)	(6)	()	()
<u>Answers to questions</u>	(19)	(3)	()	()
<u>Use of audio-visual aids</u>	(19)	(3)	()	()
<u>Use of examples</u>	(17)	(5)	()	()
<u>Demonstrations</u>	(19)	(3)	()	()
<u>Lectures</u>	(18)	(3)	()	()
<u>Laboratory sessions</u>	(9)	(10)	()	()
<u>Presentations by participants</u>	(9)	(9)	(1)	()

The participants were not informed that they would have to prepare and present reports.

2. In general, was the level of presentation

_____ too simple; 22 about right; _____ too complex

3. The written materials used in this course have been:

Not helpful

Somewhat helpful

Very helpful

1
(1)

2

3
(4)

4
(5)

5
(13)

Do you have any suggestions for improvement of the materials? reference

books be made available; need to explain the materials more fully;

would like the volumes reduced and I would them to be translated

4. The issues and problems discussed during the training were

Not relevant
to my work

Very relevant
to my work

1

2
(1)

3
(1)

4
(11)

5
(7)

Comments: this answered objectives

5. Were you satisfied with the order in which topics and activities were presented? Yes (21) No ()

If not, what would you change? the last class relative to post-harvest
should have been given at the beginning of the course

6. How satisfactory was the length of the course?

9 too short; 13 about right; _____ too long

7. Which of the sessions included in the present course do you feel should be lengthened or expanded? economics, storage handling, data, pest

control, structure of cereal, post harvest, insects, chemical and

physical changes, moisture control, pest control, farm losses; detection
of molds; maintenance; on the whole it was very good--thanks

8. Which of the sessions included in the present course do you feel should be shortened? none, marketing; the economics part--simple make 2 groups

from the beginning so we can talk about each step in more detail

(written by a technical student)

9. What topics, if any, do you feel should be added to this course?

none, international economics, cereal production, seed processing, how to use drying ventilators; learn all the practical methods for drying and preservation; study of each participating country--identify the problems and try to find solutions

10. What topics, if any, do you feel should be omitted from this course?

none; eliminate economics for technical group; very satisfied; everything was good

VIII. OVERALL SATISFACTION

1. Please indicate your overall satisfaction with the course by circling a number on the scale below:

Poor				Excellent
1	2	3	4	5
		(1)	(12)	(8)

Comments: course very useful but more time needed; this was a new discovery in my life; I learned a lot and it was a chance for me to see this country

2. The subject matter for this course is:

Not important for your job				Very important for your job
1	2	3	4	5
		(2)	(7)	(12)

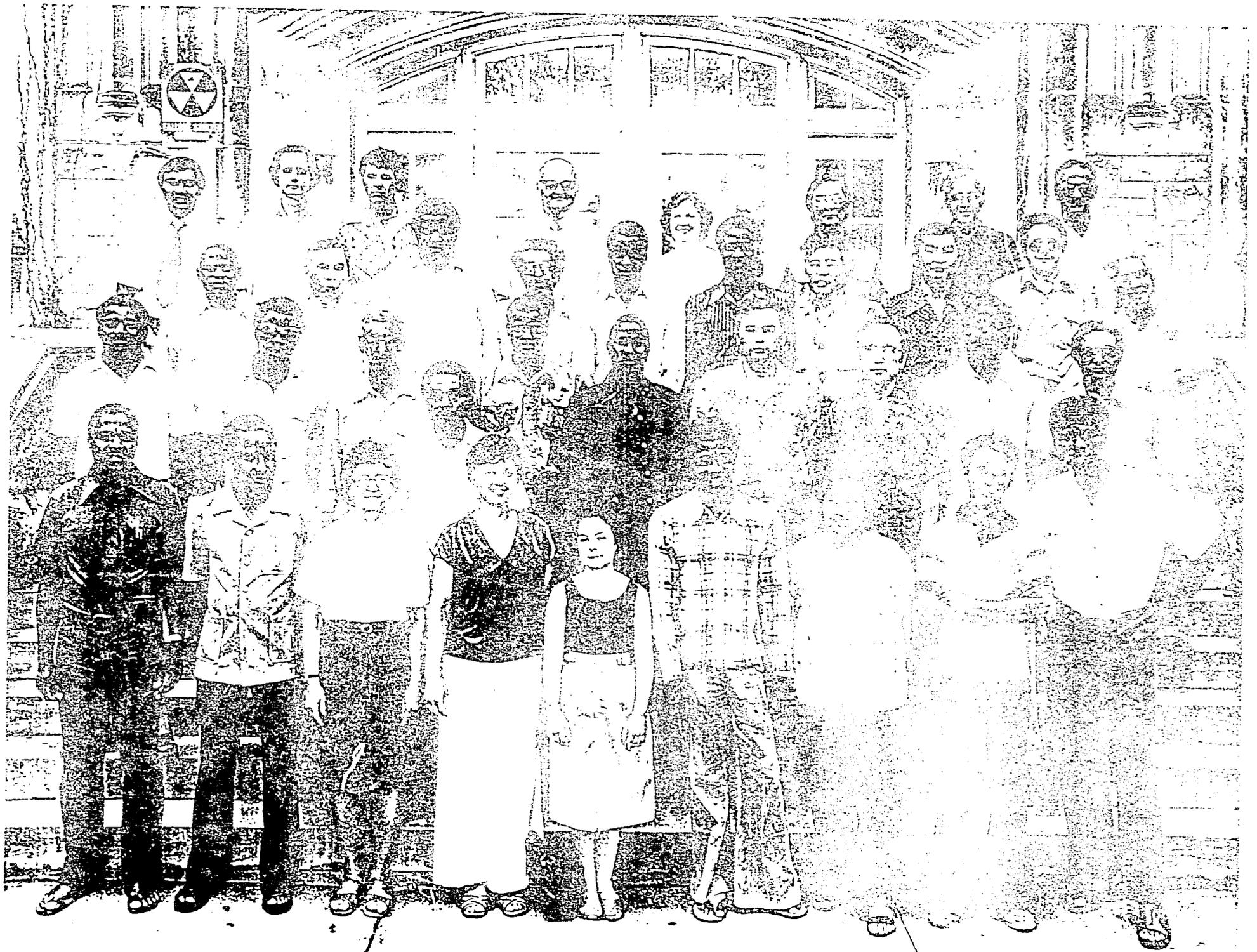
Comments: because I work in cereal office; this was very much in my area because I am in charge of management warehousemen and this will allow me to teach them what to do to have better management

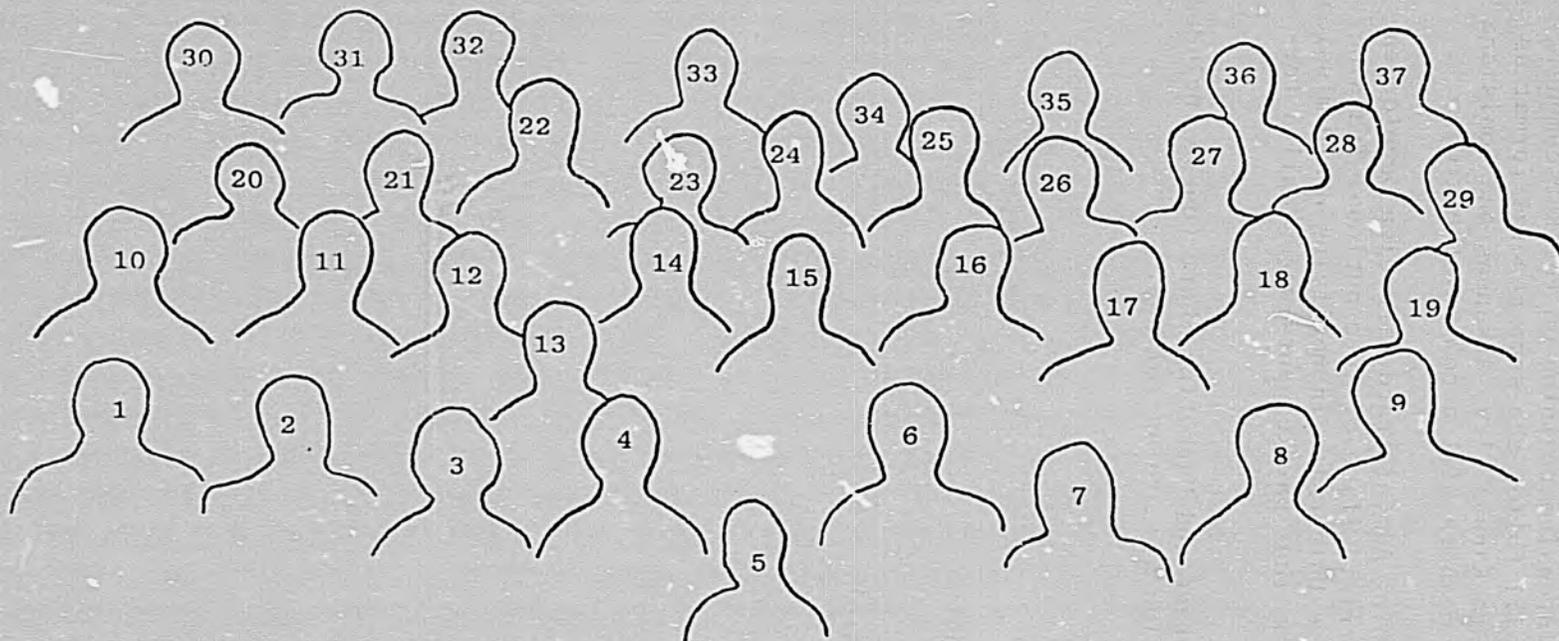
3. How valuable or beneficial has this course been overall in terms of your professional needs and responsibilities?

Not at all		Somewhat		Very valuable
1	2	3	4	5
		(2)	(6)	(12)

Comments: we have learned many things but haven't the means to apply them in our country

4. Of all you have learned or experienced during the training program, what will be the most useful to you professionally in your home country? financial and marketing aspects; ways of improvement and new methods; project analysis; the way of grain marketing and grain storage in addition to the management of grains; microflora, aeration of grain all, handling, storage, inspection, fumigation, insects, storage structures, moisture control, marketing process, storage methods, sanitation, cereal storage and preservation, grain marketing, technical part, grain protection and storage; transportation; planning; everything in general;
5. Please check one of the following:
- (19) I would recommend this course to other participants with backgrounds and interests similar to mine.
- (1) I would not recommend this course to other participants with backgrounds and interests similar to mine.
6. In addition to the comments you have made, do you have any other suggestions which we might be able to implement for next year's course? small group discussions--some participants were shy; need more feedback; open discussions after lectures; include in the certificate some details about the course especially the report and the fundamentals of the course; visit more farms; more essay questions on test--cut yes/no by 50%; inform participants to collect data for country reports; add problems of calculations; certificates should be given only to those who learned the material and not to those who are here for vacation; overall it was good, but there are things that take time to understand so the length of the course should be increased; very profitable and interesting and good training; would like questionnaire from the start to evaluate each part more precisely; present machinery that is more realistic in line with the economy of the participant countries; the possibility of lengthening the course; I think the participants should be well acquainted with the subject matter before taking part in the course; I think the financial problem should be reviewed because the per diem is not sufficient;
thank you





- | | | |
|---------------------------------------|---|---|
| 1. Roman Thomas Haule - Tanzania | 14. Gabriel Mpungah - Tanzania | 25. Abassiri Akorpini Adolphe - Upper Volta |
| 2. Solomon N. Nnko - Tanzania | 15. Rouamba Jean-Baptiste - Upper Volta | 26. Haeng Ha Kim - Korea |
| 3. Dr. Rosemary Burroughs - Staff | 16. Ji Leong Kim - Korea | 27. Byung Seo Ryu - Korean Interpreter |
| 4. Dr. Valerie Wright - Staff | 17. Young Kook Kim - Korea | 28. Guillermo Herrera Castro - Costa Rica |
| 5. Marcie Porter - French Interpreter | 18. Cisse Aboubakary - Upper Volta | 29. Mr. Ernie Gutierrez - Group Leader |
| 6. Toure Amadou - Upper Volta | 19. Ahmed Frhan Al-Attrab - Yemen | 30. Dr. Ulysses Acasio - Staff |
| 7. Josefina Licuanan - Phillipines | 20. Abdu Ally MBaga - Tanzania | 31. Mr. Cornelius Hugo - Staff |
| 8. Ahmed Abdulkader A. Zaid - Yemen | 21. Kun-shan Su - Taiwan | 32. Dr. Roe Borsdorf - Staff |
| 9. Luke M. Masuku - Swaziland | 22. Johannes F. Mbuli - Swaziland | 33. Dr. Robert Julian - Staff |
| 10. Louis X. Ngonyani - Tanzania | 23. Yousef Nagi Ahmed Assalimy - Yemen | 34. Kathy Foster - Staff |
| 11. Kaswija Mtebe - Tanzania | 24. Ouedraogo Simande - Upper Volta | 35. Dr. Do Sup Chung - Staff |
| 12. Tesfaye Adem - Ethiopia | | 36. Dr. John Pedersen - Staff |
| 13. Ernest G. Mosha - Tanzania | | 37. Dr. Robert Mills - Staff |

B. AID Grain Storage and Marketing Short Course - 1980

Participants for the 1980 Grain Storage and Marketing Short Course arrived on campus June 15, 1980 after a one-week orientation in Washington, D. C.

Participants will spend 7 weeks of intensive training on the KSU campus. The training for the 1980 short course will follow the same general format as the 1979 short course with a field trip to Kansas City, Arkansas and Louisiana being taken the fifth week. Five staff members will accompany the group.

Mr. Robert Doan, International Training Administrator, Foreign Development Division, U.S.D.A. and Mr. Nathaniel Ferris, Office of International Training, AID have worked closely with Kansas State University in notifying USAID missions world-wide of the short course and seeing that participants were "called forward" to attend this course.

Participants for the 1980 Grain Storage and Marketing Short Course included 32 individuals from 15 different countries and are as follows:

AFRICA

- | | |
|-------------|---------------------------|
| Burundi | - Rénovat Baragengana |
| | - David Barendgere |
| | - Herménégilde Nikoyagize |
| Kenya | - Michael Gitau |
| | - Richard Kipyegon Malel |
| Mali | - Macky Traore |
| Nigeria | - Alajaba Umar |
| | - A. S. Y. Abdulazeez |
| | - Isyaku Mohammed |
| | - Malami Sulaiman |
| Togo | - Assiongbon N. Kpodar |
| Upper Volta | - Bayala Bationo |
| | - Maxime Gouba |
| | - François Ouandaogo |
| | - Oumar Ouedraogo |
| | - Zinguim Banse |

ASIA

- | | |
|----------|----------------------|
| Japan | - Masayuki Hamaguchi |
| Malyasia | - Syed Azmi Othman |
| | - Ahmad Hassan |
| | - Abdul Rashed Omar |

LATIN AMERICA

- Brazil - Joamar Jaquetti
 - Maria Regina Sartori
- Costa Rica - Franklin Juárez M.
- Ecuador - Jaime Gallegos M.
- Honduras - René Efrain Arias
 - Manuel Andrade
 - Antonio René Soler Orellana
- Mexico - José S. Elías Reyna
 - Jehú Roset Díaz
- Nicaragua - Aura María Galán de Velásquez

NEAR EAST

- India - Ravindranath Karicherla

Evaluation and summary of the 1980 Grain Storage and Marketing Short Course will be included in next year's annual report.

C. Short Term On-Campus Training

Korea - Training was provided over a 5-week period (October 10-November 9, 1979) for the following participants:

- Dong Hwan Kim, Assistant Director, EPB (Project Evaluation)
Chung Hoi Koo, Assistant Director, EPB (Policy Analysis)
Il Sung Shin, Assistant Director, EPB (Project Evaluation)
Ik Hong Um, Mar-Data Processing, Statistics Bureau, EPB
Kang Soon Yoon, Engineer, Korea Development Bank.

The training was co-sponsored by the Economic Planning Board (EPB), Republic of Korea and was titled, "Computerized Methods for Feasibility Analysis."

D. Degree Program Training

Several students are in various stages of progress toward advanced degrees in post-harvest grain technology under AID and other international organizations' support. Participants are listed on the following page with the area of study included:

1. Grain Science

Dansou Kossou - Benin (Dahomey)
Muljo Sidik - Indonesia
Steve Graham - Former Peace Corps (Benin)
Carl Reed - Costa Rica
R. D. M. Bediako - Ghana (Crop Protection)
Mboye N'Dir - Senegal (Crop Protection)
Maria Regina Sartori - Brazil

2. Agricultural Economics

Cornelius Hugo - Venezuela
Zenida Toquero - Philippines
Elizabeth Sto. Domingo - Philippines
Esterlina Olan - Philippines

3. Agricultural Engineering

Dong Il Chang - Korea
Kyung K. Park - Korea
Ronald Jimenez - Costa Rica
Joselito Dela Cruz - Philippines
Apolo Guiverra - Philippines
Yousef Assalimy - Yemen
Bruce Sebræe

E. Off-campus Training

1. Costa Rica - CIGRAS (Centro para Investigaciones en Granos y Semillas)

The Grain Storage and Management Short Course was conducted in San José, Costa Rica August 20 through 29, 1979. The training was conducted by Dr. Robert Mills, Entomologist; Mr. Carl Stevens, Storage Engineer; and Mr. Carl Reed, Post-harvest Loss Specialist. Dr. Ted Granovsky and Dr. Miguel Mora, KSU graduate from Costa Rica, also assisted in the training.

The training was provided for 14 employees of Consejo Nacional Produccion (CNP). Included in the subject matter was (a) structure of cereal grain kernels, (b) design, maintenance and operation of facilities, (c) sanitation and (d) identification of insects/rodents/birds and their control.

F. Training Facility

Modifications are being completed on facilities to be used in practical "hands on" training for short course and degree program participants.

IV. LABORATORY AND DEVELOPMENTAL SERVICES

This section of the annual report is devoted to describing activities under Contract AID/ta-C-1162 that are rather broad in scope and not specifically directed to any one USAID Mission or host country. It includes activities that may have application and utilization in many host countries by USAID Missions such as: (1) developmental services, (2) development of slide series, (3) preparation of Grain Storage and Marketing manuals, and (4) linkages with other U. S. and foreign technical assistance programs.

A. Developmental Services

1. A Bibliography on Post-harvest Losses of Grains

Dr. Fabian N. C. Osuji, Senior Lecturer in Zoology, University of Ibadan, Ibadan, Nigeria spent a 6-month sabbatical leave at Kansas State University in 1978. During this time, Dr. Osuji prepared a review and annotated bibliography on post-harvest losses in grain legumes.

This material is in the final stages of editing and will soon be published as a Food and Feed Grain Institute Special Report.

2. Flight capability and factors involved in initiating grain infesting Sitophilus weevil flights.

Sitophilus spp. weevil flight capability and factors affecting flight (age, light, time of day, population density and conditions of food material) were investigated. Only S. zeamais flew; S. oryzae and S. granarius did not under any conditions. S. zeamais flew mostly during light periods regardless of time of day. Most flights occurred with weevils between the ages of 10 and 30 days with a peak at 13 days. Populations ranging from 50 to 800 weevils per 100 grains of maize resulted in increased total flights as population increased but the percentage did not vary significantly. Molded grain resulted in more flights than clean grain. These very basic studies were conducted to provide a basis for other studies to study field infestation of maize as a source of farm losses.

3. Milled Rice Losses in Simulated Bag Storage.

Sitophilus zeamais and Tribolium castaneum were used to infest milled rice separately and in combination. Volumetric, gravimetric and a flotation method were used to assess losses. Losses were greatest in the Sitophilus-Tribolium combination, however, they did not differ significantly from those caused by Sitophilus alone. Tribolium alone caused significantly lower losses. Odor tests showed that the Sitophilus-Tribolium combination caused a detectable undesirable odor after 3 months. Tribolium alone caused an undesirable odor after 5 months.

4. Grain Properties Affecting Storage and Drying.

The purpose of this research was to study the following properties of several cereal grains, legumes and oilseeds: quality loss (modeling); hygro-

scopic equilibrium isotherms (equilibrium moisture content/equilibrium relative humidity): specific heat; test weight.

- Quality loss (modeling)--Five different mathematical models were developed to predict the dry matter loss for given time, temperature, moisture content and mechanical damage levels in high moisture shelled corn using carbon dioxide production data obtained by J. S. Steele at Iowa State University in 1967. The equations were solved also for time to compare with Steele's equation. The best model was tested using data collected in 1978 after instrumentation for measuring carbon dioxide production had been improved.

- Hygroscopic equilibrium isotherms--A comparative study of static and dynamic methods to obtain hygroscopic equilibrium isotherms of 16 different grains was made using aqueous sulfuric acid solutions to maintain relative humidity (static method), a hygroscopic-pump technique (dynamic method) and a container-type hygrometer (static method--Abbeon model #R-560A). Hygroscopic equilibrium isotherms of another five grains were obtained using only aqueous sulfuric acid solutions.

The data obtained was used to compare the Chung and Thompson equilibrium relative humidity models which were then modified by incorporating chemical composition of the grains to find a set of constants applicable for all commodities.

- Specific heat--The specific heats of 16 different grains were determined at five levels of moisture content by the method of mixtures. The method consisted of determining the temperature change of toluene contained in a calorimeter. Then the specific heat of each grain was related as a linear function of moisture. The same procedure, using water instead of toluene and three levels of moisture content, was used to determine the specific heat of the same grains. A comparison of the data from each method for each grain was made. The pooled specific heat data of all the grains obtained by both methods was expressed as a linear function of grain chemical composition.

- Test weight--The test weight of 22 cereal grains, legumes and oilseeds was measured at five moisture content levels using the standard test weight per bushel apparatus. Test weight of each grain was related as a linear function of moisture content.

The relationships of grain properties developed in this study can be used in the "Design of natural air drying systems" simulation program KSUDRYER.

This manuscript is authored by Gangadhar Rao Vemuganti in cooperation with Dr. Harry B. Pfoest and is soon to be printed as a Research Report in the Grain Storage, Processing and Marketing series.

5. Susceptibility of Millet Varieties to Insect Infestation and Loss.

Comparison of the susceptibility of various varieties of millet to insect and mold invasion studies continues. Bulk and head storage of several varieties of millet are also being compared to determine the loss potential

in storage. This will be further investigated in field surveys and study.

6. Post-harvest Deterioration of Rough Rice.

Dry matter weight loss- temperature- moisture- storage time relationships for rice are being studied. CO₂ evolution is being used to follow the deterioration of rough rice, brown rice and milled rice during storage at four temperatures and four moisture levels.

7. Application of Transportation Linear Programming for Optimum Number and Location of Public Rice Warehouses in Sri Lanka.

Since World War II, successive governments of Sri Lanka have been directly involved with the operation of a rice subsidy scheme whereby a significant segment of the population has been provided with a subsidized weekly rice ration. This welfare system, though providing sufficient additional caloric intake to those affected by it, has diverted significant quantities of limited resources from potentially more beneficial undertakings.

The awareness of the high costs incurred by the subsidy system and opportunities foregone brought about the involvement of the Food and Feed Grain Institute in assisting the Government of Sri Lanka in, among other things, reviewing the current rice ration distribution system and assessing potential improvements.

The focus of this study limited itself to a transportation-distribution analysis of the current ration rice distribution system. More specifically, it sought to find optimum location and number of public rice warehouses used in the distribution system throughout the country. However, due to the peculiar structure of the distribution system and the magnitude of the same, the solutions obtained are of a feasible-rational rather than feasible-optimum nature.

Parts of a computerized system for feasible agribusiness development was used for the analysis. Relevant projections of supply and demand were developed from primary data with the Master Projection Program. Necessary transportation cost functions and other network information was obtained from surveys, other studies, and other specific computer programs. Finally, the Linear Transportation Analysis Program was used to analyze the distribution of ration rice from rice mills and import points to public warehouses and to distribution centers.

Given the number and locations of rice mills and distribution centers for ration rice, a total of 56 potential sites for public rice warehouses were analyzed. Successive eliminations of undesirable sites resulted in a total of 18 possible site selection combinations ranging from 54 to 13 sites. Also, 13 sites selected by the Office of the Food Commissioner prior to the analysis were analyzed. A total of eight (8) were found to be in less than desirable locations with respect to the rice mills and distribution centers. Finally, estimated annual deficits for the rice ration system were determined and allocated for importation to the ports of Colombo and Galle for "minimum" inland transportation cost and "optimum" distribution pattern.

The results of these analyses suggest that more than 50 percent of public rice warehouses currently used can be removed from the existing distribution system without impacting significantly on transportation costs. However, further reductions in the number of these storage facilities within a range of 25 to 13 locations tend to have increasingly greater impacts on transportation costs. Therefore, apparent significant benefits in terms of operational savings and increased overall efficiency can be derived by removing 31 to 43 storage facilities from the current distribution system of ration rice.

Due to data and other constraints, as well as scope of work, this study did not address exact tradeoffs between operational (storage) and transportation costs. For the same reasons long-term projections and analysis were not undertaken. Nevertheless, very attractive benefits can be obtained from a modification of the current ration rice distribution system, and changes should be implemented, since it is felt strongly that the omitted tradeoff analysis would only substantiate such changes.

These investigations are now completed and will be issued in the near future as a research report in the Grain Storage, Processing and Marketing series.

8. Systems for Assessment of Post Production Losses of Rice under Alternative Marketing Patterns.

This work continues under cooperative agreement with the International Rice Research Institute in Los Baños, Philippines. Detailed IRRI data for alternative small farmer marketing systems from field studies conducted in the Central Luzon and Bicol Regions of the Philippines provide the analytical basis. Under the direction of an IRRI staff member on leave, multiple regression analysis, cluster analysis and other techniques are being used to identify the key "cause and effect" relationships. Significant "new" findings are emerging, and a major publication is anticipated at the conclusion of the study. It is anticipated that a draft manuscript will be available for review in late 1981.

9. Feed Processing Plant Design and Analysis for Developing Countries.

This study is being continued and is being conducted to develop a computer model of optimum feed mill design (equipment selection and arrangement) by considering operating costs, especially energy costs and initial investment costs.

10. Grain Storage Facility for On-farm Use in Developing Countries.

The investigation is being conducted to formulate a suitable construction material for on-farm grain storage in developing countries, utilizing indigenous materials such as clay, lime, salt, rice hull ash and straw. The strength and durability of materials formulated were evaluated. The results are being analyzed.

11. Rough Rice Drying and Storage Systems.

Various rough rice drying methods, especially natural air drying and storage systems, are being analyzed in order to design an optimum system for drying and storage under different conditions and situations.

12. Loss Assessment Techniques on Various Types of Cereal Grains.

Two commonly mentioned loss assessment methods, the count and weigh method and the volume/weight method, are being evaluated. Losses due to Sitophilus zeamais are being measured in four grains (wheat, sorghum, maize and rough rice) to determine the degree of reliability of the two methods. Previous research has not reported how accurate these methods are in predicting losses.

13. Moisture Migration within Stored Grain.

The investigation is being conducted to examine moisture migration patterns within stored grain due to the change in grain temperature.

14. Static Pressure Drop in Fixed Bed of Grain as Affected by Grain Moisture Content.

This project was undertaken for two reasons: (1) to understand the role of grain moisture on resistance of grain to airflow and (2) to investigate if it is possible to save energy for high moisture grain storage.

Preliminary observation shows resistance of airflow to corn, sorghum and wheat decreases with moisture content. For high moisture grain storage, this may mean that we will be able to use a lower horsepower motor than what is presently designed on the basis of Shedd's data for dry grain.

15. Computerized System for Feasible Agribusiness Development.

This system was completely revised and updated last year. The fully-operative, major computer programs in the system and development improvements include:

a. IRR Feasibility Analysis Program

- Addition of Economic Rate of Return and Net Present Value features so that the program now computes Rates of Return for Internal/Direct, Associated/Social/Financial/Comparative/and Economic as well as Comparative Present Value and Net Present Value. The ERR option permits application of shadow pricing, following the World Bank guidelines for developing countries.

- Refinement of terminology of printed program output under Spanish, French and Portuguese options to reflect standard capital budgeting terminology in these languages.

- Internal programming revisions to capitalize on potential computational efficiency made possible by the installation of "Super P" Fortran computer at KSU in July 1980.

b. Master Projection Program with Multiple Options

- Addition of specially-designed subroutines for analysis of needs and opportunities for food security reserves in developing countries. This methodology is documented and published in Special Report No. 9, "ASEAN Food Security Reserves--How They Might Have Worked From 1960 to 1977," dated January 1980. This report was authored by Dr. Richard Phillips, Dr. Doyle Jeon and Elizabeth Sto. Domingo and is of the Grain Storage, Processing and Marketing series.

- Internal program revisions to capitalize on the potential computational efficiency due to installation of the "Super H" computer.

c. Program for Developing Proforma Financial Statements

- Inclusion of additional features for analysis to determine optimum strategies to take advantage of income tax and other public incentives applicable in each country and local situations.

- Internal program revisions to capitalize on potential computational efficiency due to installation of the "Super H" computer.

These additional features have been documented and installed for incorporation in the 3rd edition of Special Report No. 2, to be published in 1981. Preliminary development work is underway for connecting at least some of these programs to computer language applicable for the Apple and other micro-computers. Informal cooperative arrangements have been made with the Department of Economics at Iowa State University in anticipation that micro-computer potential will some day add much to capability for rigorous economic analysis in the developing countries.

16. Application of the Computerized System to Developing Country Problem Analysis.

A number of applications of the computerized system to developing country problem analysis were made during the year. Some of these are reported elsewhere in connection with the corresponding country USAID Mission requests and resulting country reports. Additional major applications during the year include the following:

- Application of Transportation Linear Programming for Optimum Number and Location of Public Rice Warehouses in Sri Lanka. This program is reported under No. 7 of this section of the annual report.

- Development of analytical country cases for instructional use at the annual international Grain Storage, Processing and Marketing Short Course.

- In-depth analysis of grain stabilization policies and programs in the Republic of Korea. This is a cooperative effort with the Korean Rural Economics Institute and the Republic of Korea's Economic Planning Board.

17. Analysis of Food Grain Security Reserves in Developing Countries.

Growing from project response to requests by the AID/W Asia Bureau, ASEAN and the USDA Grain Sales Manager's Office, this work involves major activity and achievement during this year.

- The specialized computer analysis was developed and the first major application was made to the ASEAN countries of Indonesia, Malaysia, Philippines, Singapore and Thailand. Special Report No. 9 details findings of the analysis.

- The methodology was applied to food security reserves for the Northeast Asia republics of Korea, Taiwan, Japan and Hong Kong. The findings will be reported in a Food and Feed Grain Institute Special Report next year.

- The interests of those concerned with food grain stabilization programs and potentials for food security reserves in Bangladesh, India and Sri Lanka prompted parallel analysis for these countries plus the Central Asian countries of Nepal, Pakistan and Afghanistan. Findings will be included in the report mentioned above.

- Interest has extended to other areas of the world and study is underway applying the methodology to food security reserves for the Central American countries. Centered on cooperative research with the Honduran Institute of Agricultural Marketing (IHMA), publication of the findings is anticipated in 1981.

18. Quantitative Analysis to Support LDC Grain Policies and Programs.

Work has begun in response to the growing number of USAID Mission requests for assistance to host country agencies in planning grain policies and programs to assist small farmers and low-income consumers. Staff members have continued to respond to these requests and assist in host country policy analysis. The weakness has been in the lack of research-based "capital stock" to maximize the value of technical assistance in the area--a weakness this project is designed to overcome.

To date, some simulation analysis has been conducted and a number of draft discussion papers have been prepared. Achievements to date include the following:

- An in-depth analysis of the impacts of PL 450 wheat imports on small farmers and low-income consumers in India was completed. The study may be printed as an Institute report.

- Using Honduras as a case country, an analytical framework for food grain policy analysis was developed and partially tested. However, further work is needed before considering publication of the results.

- As part of the analytical support to the SEARCA program, preliminary analysis was made of the consequences of certain policy alternatives

in the Philippines. Some of the analysis and results were released to UPLB staff members and to the National Grains Authority. More work is required before definite recommendations can be made.

- An in-depth analysis of food grain policies in Korea is underway, using an established project as a vehicle. One or more publications are anticipated during 1981.

B. Slide File

As each of the teams under Contract AID/ta-C-1162 work in the field, we continue to build our file of colored slides showing grain storage, processing and marketing situations. The slides have been used extensively in training sessions conducted at Kansas State University, both in the AID Grain Storage and Marketing Short Courses held in 1970, 1971, 1972, 1974, 1975 through 1979, and in discussing grain storage and marketing with visitors and students under the USAID sponsorship. Also, these slides are used in teaching off-campus training programs.

As the slide file continues to build, we plan to compare series of slides with either taped or printed narratives on various aspects of storage and marketing that can be distributed to USAID Missions for use in self-training programs.

C. Preparation of Grain Storage and Marketing Manuals

Training Manuals

1. Revision of Volume 2, Special Report 2, "User's Guide to Computerized System for Feasible Agribusiness Development" continues. The report will be used for special on-campus training at KSU by the staff members in the Agricultural Economics Department.
2. The short course presented in Costa Rica in October 1979 required the development of a training manual which was titled, "Course on Grain Storage and Management for the National Production Council." The manual was also translated into Spanish and simultaneous translation was given during the course.
3. Work has begun on the development of a short course manual for the Senegal in-country short course scheduled for September 1980.
4. Work continues on a manual with grain standardization and grading systems for developing countries by staff of the Grain Science Department/Food and Feed Grain Institute.

D. Other U. S. and Foreign Technical Assistance Programs

1. Taiwan, Republic of China

Dr. John R. Pedersen traveled to Taipei January 4 through 13, 1980 to

attend the International Symposium on "Recent Advances in Food Science and Technology." He presented a paper entitled, "The Role of Grain Storage in Quality Preservation."

2. Seoul, Korea

Dr. Do Sup Chung observed and reviewed existing imported grain handling, storage and distribution systems, and to provide recommendations for improving the systems. The assistance was at the request of the U. S. Feed Grains Council, U. S. Embassy/Korea and was given April 12 through 28, 1980.

3. Manila, Philippines

Dr. Richard Phillips traveled to Manila June 1 through June 28, 1980 under the KSU/Philippine Project to act as consultant to the Ministry of Agriculture-Planning.

4. Canberra, Australia

The Annual GASGA (Group for Assistance on Systems relating to Grain After-harvest) meeting was held in Canberra, Australia June 6 through 14, 1980 and was the 14th annual meeting. Dr. Charles W. Deyoe and Dr. John R. Pedersen, acting as KSU representatives, attended the meetings.

V. ADDITIONAL ACTIVITIES

A. Conferences and Seminars

As a means of keeping current in the latest developments related to grain storage and marketing, staff members attend and participate in professional conferences and seminars.

1. Short Course Tour. July 1979

Dr. John Pedersen, entomologist; Dr. Chang Joo Chung, visiting professor-Ag. Engg.; and Ulysses Acasio and V. G. Rao, research assistants, conducted a short course tour for 24 participants from 9 countries who attended the annual Grain Storage and Marketing Short Course. The students studied storage, processing, marketing and transportation at various sites located in Kansas City, Arkansas and Texas.

2. American Agricultural Economics Association Summer Meeting. Pullman, Washington, July/August 1979

Dr. Richard Phillips, agricultural economist, and Zenaida Toquero, research assistant, attended meeting dealing with trade, development and other international agriculture issues.

3. Association of Operative Millers. Brainerd, Minnesota, September 1979

Dr. John R. Pedersen, project grain quality/preservation specialist, attended AOM meeting as Food Protection Committee member.

4. Elevator Design Conference. Kansas City, Missouri, September 1979

Dr. Ekramul Haque and Carl Stevens, grain storage engineers, attended this conference sponsored by the National Grain and Feed Association to gain additional knowledge for planned project developments.

5. Rice Grading School. Stuttgart, Arkansas, October 1979

Carl Reed, grain storage specialist, attended training in rice grading at the Federal Grain Inspection Service to work more closely with rice-related problems.

6. "Online '79" Conference and Exposition. Atlanta, Georgia, November 1979

Cherie Geiser, PHDS coordinator, attended conference for training on data base preparation in conjunction with the Postharvest Documentation Service.

7. American Society of Agricultural Engineers Winter Meeting. New Orleans, Louisiana, December 1979

Dong Il Chang, graduate research assistant, attended meetings and presented a paper entitled, "Grain Dryer Selection Model."

8. American Society of Agricultural Engineers. St. Joseph, Missouri, March 1980

Dr. Ekramul Haque, grain storage engineer, attended the Mid-Central Regional meeting and presented a paper entitled, "Design Procedures for Grain Storage Beans."

9. National Agri-Marketing Association. Chicago, Illinois, April 1980

Dr. Roe Borsdorf, agricultural economist, attended this national convention to obtain additional information on national marketing/transportation data.

10. Association of Operative Millers. Dallas, Texas, April 1980

Dr. John Pedersen, project grain quality/preservation specialist attended meetings and served as Food Protection Committee member.

11. American Society of Agricultural Engineers. San Antonio, Texas, June 1980

Dr. Ekramul Haque, grain storage engineer, attended ASAE summer meeting and presented a paper entitled, "Pressure and Velocity Field in Airflow Through Packed Bed of Corn Mixed with Fines under Non-Darcy Flow Conditions."

B. Reports

A report is prepared for each overseas technical assistance assignment which Kansas State University completes under an AID contract. The following reports were completed under Contract AID/csd-1588; Food Grain Drying, Storage, Handling and Transportation Report series:

TECHNICAL ASSISTANCE REPORTS

- *No. 1 Rice Drying Technology and Equipment Which Might be Applicable to Tropical Developing Countries. June 1968. Prepared by Dr. T. O. Hodges.
- *No. 2 Brief Description for a Corn Handling Facility in Tropical Areas. June 1968. Prepared by Dr. T. O. Hodges and Dr. Harry B. Pfost.
- *No. 3 Structural Requirements of Grain Bins. July 1968. Prepared by Dr. T. O. Hodges.
- *No. 4 Report on Food Grain Storage, Marketing, Handling and Transportation in Jordan. July 1968. Prepared by John R. Pedersen.
- *No. 4a Photographic Supplement, Food Grain Storage, Handling and Transportation in Jordan. July 1968. Prepared by John R. Pedersen.
- *No. 5 A Proposal to Equip Metal Silos in Jordan with Aeration and Temperature Monitoring Equipment. August 1968. Prepared by John R. Pedersen.

*Indicates supply depleted-copies available on microfiche only.

- No. 6 Review of Grain Storage, Handling, Processing and Distribution Problems and Proposals in the Republic of Korea. September 1968. Prepared by Alden A. Ackels, Dr. P. Gormely and Martin Keck.
- No. 7 Assessment of Food Grain Storage Facilities, West Pakistan - 1968. October 1968. Prepared by Dr. T. Leo Wendling.
- No. 8 Implementation of Grain Storage Operations, Marketing Services and Price Stabilization in Honduras. October 1968. Prepared by John R. McCoy and Dwight S. Tolle.
- No. 9 Annual Report - 1967-1968 (November 1968).
- *No. 10 Review of Grain Storage Handling and Distribution - Morocco 1969. April 1969. Prepared by Alden A. Ackels and John R. Pedersen.
- *No. 11 Report on Grain Sanitation Workshop - July 7-12, 1969. Central Food Technological Research Institute, Mysore, India. July 1969. Prepared by John R. Pedersen.
- No. 12 Annual Report - 1968 - 1969.
- *No. 13 Observations and Recommendations Concerning the Corn Marketing System in Guatemala. August 1969. Prepared by L. Orlo Sorenson.
- *No. 14 An Analysis of Grain Storage and Price Stabilization Problems in El Salvador. September 1969. Prepared by John McCoy and Floyd Niernberger.
- *No. 15 Review of Elevator Project in Honduras. October 1969. Prepared by Dr. Harry B. Pfost.
- *No. 16 A Review of Rice Drying and Storage Problems in Ecuador. January 1970. Prepared by L. Orlo Sorenson.
- No. 17 Cereal and Dry Edible Bean Marketing and Warehousing in the States of Piaui and Paraiba, Brazil. February 1970. Prepared by Dwight S. Tolle.
- *No. 17a Warehousing and Marketing Cereal and Beans in the State of Piaui, Brazil. February 1970. Prepared by Dwight S. Tolle.
- No. 17b Warehousing and Marketing Cereal and Beans in the State of Paraiba, Brazil. February 1970. Prepared by Dwight S. Tolle.
- No. 18 Annual Report - 1969-1970
- *No. 20 Observations and Recommendations for Improving Grain Storage and Marketing in Colombia. December 1970. Prepared by Dr. Richard Phillips and Dr. Harry B. Pfost.
- *No. 21 A Study and Plan for Regional Grain Stabilization in West Africa. December 1970. Prepared by Alden A. Ackels, Donald E. Anderson, George Brinkman and L. Orlo Sorenson.
- *No. 22 Observations and Recommendations for Improving Grain Storage and Marketing in Bolivia. May 1971. Prepared by Dr. Floyd F. Niernberger and Dr. Harry B. Pfost.

- No. 23 Annual Report - 1970-1971.
- *No. 24 Recommendations for FECOAGROH Grain Storage and Handling Facilities in Honduras. July 1971. Prepared by Elwyn S. Holmes.
- No. 25 Observations and Recommendations for Construction of Feed Mills in Senegal, Mali and Mauritania. August 1971. Dr. Harry B. Pfof.
- No. 27 Observations and Review of Regional Grain Storage and Purchasing Facilities in Guatemala. September 1971. Prepared by Dr. Do Sup Chung.
- *No. 28 Improved Grain Marketing in Panama During the Decade Ahead. October 1971. Prepared by Dr. Richard Phillips.
- No. 29 Rice Storage, Handling and Marketing Study for the Republic of Indonesia. February 1972. Prepared by Food and Feed Grain Institute, Manhattan, Kansas.
- *No. 30 Tour of Some U.S. Grain Storage Facilities for Entente Fund Officials. May 1972. Prepared by Dr. Do Sup Chung.
- No. 31 Progress Report on Development of a Simple Storage Unit and Method Applicable to Humid Areas. June 1972. Prepared by Dr. Do Sup Chung.
- No. 32 An Evaluation of INDECA's Role in the Guatemala Rural Development Program (Loan Paper Compliance and Organizational Efforts). February 1972. Prepared by James W. Lemley.
- *No. 33 Supply and Demand Projections for Food Grains in Ethiopia, 1970-1980. December 1972. Prepared by Mr. Fekadu Ebba and Dr. Richard Phillips.
- No. 34 Annual Report - 1971-1972.
- *No. 35 Review of Economics and Engineering Study - Rice Storage, Handling and Marketing. The Republic of Indonesia. March 1973. Prepared by Dr. Harry B. Pfof, Dr. Richard Phillips, Dr. Do Sup Chung and John R. Pedersen.
- No. 36 Needs and Opportunities for Improved Grain Marketing in Panama. Executive Digest. March 1973. Prepared by Dr. Richard Phillips.
- No. 37 Research Report - Development of a Simple Grain Storage Unit and Method Applicable to Humid Areas. I. Laboratory Testing for Small Scale On-farm Drying and Storage. March 1973. Prepared by Dr. Do Sup Chung and Louis F. Fleske.
- No. 38 Recommendations for Technical and Managerial Assistance - Rice Modernization Project - Guyana. May 1973. Prepared by Alden A. Ackels.
- No. 39 Priorities for Improving Grain Marketing in Indonesia. May 1973. Prepared by Dr. Richard Phillips and Dr. Do Sup Chung.
- *No. 40 Report on the Storage of Imported Corn in Indonesia. May 1973. Prepared by Dr. Richard Phillips and Dr. Do Sup Chung.

- No. 41 Survey of the Quality of Imported Corn Stored in East Java, Indonesia-- (Supplement to Report No. 40 - June 1973). July 1973. Prepared by Dr. Do Sup Chung and John W. Logan.
- No. 42 Study of Grain Storage and Marketing in Bolivia. September 1973. Prepared by Dr. Harry B. Pfof and Dr. Floyd F. Niernberger.
- No. 43 Grain Marketing and Market System Development in Haiti. December 1973. Prepared by Dr. L. Orlo Sorenson and Dr. Do Sup Chung.
- No. 44 Evaluation of the Grain Management Program Simulation Model--Being Developed for Korea by Michigan State University--Contract AID/csd-2975. February 1974. Prepared by Dr. Richard Phillips and Dr. Paul L. Kelley.
- No. 45 Implicit Exchange Rate Criterion Applied to Policies Regarding Foreign Investment in Korea. February 1974. Prepared by Jung Je Joe and Dr. Richard Phillips.

Due to a change in contract, the following reports were completed under Contract AID/ta-C-1162 (Formerly AID/csd-1588); Grain Storage, Processing and Marketing Report Series:

- No. 46 Recommendations for Improving Philippine Grain Marketing and Price Stabilization Programs. May 1974. Prepared by Dr. Richard Phillips.
- *No. 47 Study of the Tunisian Grain Marketing System. August 1974. Prepared by Dr. Harry B. Pfof, Dr. Reynold Dahl, William Thornburrow and Kenneth Steinke.
- No. 48 Recommendations for Drying and Storage of Grain in Peru. December 1974. Prepared by Dr. Norton C. Ives.
- No. 49 Review and Recommendations for On-Farm Grain Storage in Tanzania. May 1975. Prepared by Dr. Do Sup Chung.
- No. 50 Evaluation and Cost Estimates for Grain Unloading, Storage and Distribution Facilities in Egypt. May 1975. Prepared by Donald S. Jack.
- No. 51 Maize Marketing in Zaire. July 1975. Prepared by Dr. L. Orlo Sorenson, John R. Pedersen and Dr. Norton C. Ives.
- No. 52 Farm Storage and Handling of Rice, Corn and Soybeans in the Guayas River Basin of Ecuador. July 1975. Prepared by Elwyn S. Holmes.
- No. 53 Evaluation of the Current Position of Agricultural Development and Diversification Program as Pertaining to Soybeans. July 1975. Prepared by Don F. Shimon.
- No. 54 Recommendations for Grain Storage and Preservation in Senegal. November 1975. Prepared by John R. Pedersen, William P. Spencer and Donald L. Pfof.
- No. 55 Grain Storage and Handling Facilities in Panama and Evaluation: Proposed Agricultural Marketing Capital Assistance Programs. March-April 1975. Prepared by Dr. Roe Borsdorf.

- No. 56 Review of Existing Proposal for Rice and Corn Drying and Storage Facilities in Ecuador. March 1975. Prepared by Dr. Do Sup Chung.
- No. 57 Assessment of Grain Storage and Marketing Facilities in the Dominican Republic. March-April 1976. Prepared by Dr. Harry B. Pfof, Donald S. Jack and Cornelius Hugo.
- No. 58 An Assessment of Agricultural Marketing Needs of the Soybean and Grains Sector in Ecuador. April 1976. Prepared by Dr. Roe Borsdorf and Dr. Walter G. Heid, Jr.
- No. 59 Bangladesh Food Grain Storage and Stock Management Study. July 1976. Prepared by Dr. L. Orlo Sorenson and Dr. Do Sup Chung.
- No. 60 Annual Report 1975-1976.
- No. 61 Evaluation of the Market System and Potential for Agricultural Products in Paraguay. September 1976. Prepared by Dr. Richard Phillips and Dr. Roe Borsdorf.
- No. 62 Evaluation of Proposed Marketing Interventions for Chad. October 1976. Prepared by Dr. Roe Borsdorf.
- *No. 63 Foodgrain and Oilseed Storage in Pakistan: An Assessment of the Sector's Problems and Plans. November 1976. Prepared by Dr. Harry B. Pfof, Dr. Dale Anderson, William Briggs, and Cornelius Hugo.
- No. 64 Annual Report 1976-1977 (In Press)
- No. 65 Evaluation of Proposed "Rural Family Grain Storage" by CARE in Chad. February 1977. Prepared by Dr. Do Sup Chung.
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