AGRICULTURE AND RURAL DEVELOPMENT

Progress Reports

on

All Active and Completed Research Projects

Funded by A.I.D. in Fiscal Years 1962-66

Prepared by TCR/ARDS for review by
the RAC at the September 27-28 meeting

(Preliminary Drafts)

AGRICULTURE AND RURAL DEVELOPMENT

Research Projects Funded in FYs 1962-66

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Development and use of improved varieties of the major cereal crops of Africa	2
Improvement of grain legume production in the Near East-South Asia and Far East regions	3
Research on the sterility method of tsetse fly control (Africa)	4
Research on farm and equipment power requirements for the production of rice and associated food crops in the Far East and South Asia	5
Analysis of factors associated with differences and changes in agricultural production in LDCs	6
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*Mapping of research requirements for the Food-for-Peace program	24

*Completed.

A.I.D. RESEARCH PROGRAM

Projects Funded in Fiscal Years 1962 - 1966

Substantive Area and Project Title	Contractor	Duration	Obligations (Thru 6/30/66)
A. AGRICULTURE AND RURAL DEVELOPMENT			
Active Projects			
1. Analysis of data on the nutrient status of soils in Latin America.	North Carolina State University at Raleigh	6/25/63 - 6/30/68	$ 980,000
2. Development and use of improved varieties of the major cereal crops of Africa.	Agricultural Research Service, USDA	4/16/63 - 6/30/68	905,125
3. Improvement of grain legume production in the Near East-South Asia and Far East regions.	Agricultural Research Service, USDA	6/25/63 - 6/30/68	569,500
4. Research on the sterility method of tsetse fly control (Africa).	Agricultural Research Service, USDA	6/14/63 - 6/30/68	541,340
5. Research on farm and equipment power requirements for production of rice and associated food crops in the Far East and South Asia.	International Rice Research Institute	6/28/65 - 6/27/68	360,000
6. Analysis of factors associated with differences and changes in agricultural production in LDCs.	Economic Research Service USDA	3/20/63 - 6/30/67	1,264,545

Substantive Area and Project Title	Contractor	Duration	Obligations (Thru 6/30/66
A. Agriculture and Rural Development - Cont'd			
Active Projects - Cont'd			
7. Comparative study of food marketing systems in Latin American countries in early stages of economic development.	Michigan State University	4/15/65 - 10/14/67	$ 395,162
8. Study of farm marketing facilities and practices in Tropical Africa.	Stanford Research Institute	5/28/65 - 11/27/67	564,037
9. Diffusion of innovations in rural societies.	Michigan State University	12/10/64 - 12/9/68	950,000[a/]
10. Analysis of data on development-related attitudes and behavior of a national sample of the Turkish peasantry.	Center for International Studies, M.I.T.	6/1/65 - 10/1/66	33,340
11. Research and training in land tenure and reform in Latin America.	University of Wisconsin	5/11/62 - 6/30/68	2,963,275
12. Analysis of programs for the development of agricultural credit institutions and services.	Ohio State University Research Foundation	6/25/64 - 10/24/67	636,821
13. Analytical study of AID/University programs in agricultural education and research.	Purdue Research Foundation	2/4/65 - 6/30/68	998,931[b/]
14. Inheritance and improvement of protein quality and content in sorghum vulgare.	Purdue University	6/30/66 - 6/30/71	315,000[c/]

Substantive Area and Project Title	Contractor	Duration	Obligations (Thru 6/30/66)
A. Agriculture and Rural Development - Cont'd			
Active Projects - Cont'd			
15. Improvement of the nutritional quality of wheat through increased protein content and improved amino-acid balance.	University of Nebraska	6/29/66 - 6/28/69	$ 370,152
16. Demand prospects for agricultural exports of LDCs.	Agricultural Research Service, USDA	6/1/66 - 5/31/69	20,000
17. Agricultural prices in economic development.	Cornell University	6/30/66 - 6/29/69	266,000
18. Technical and economic factors associated with establishment of a seed industry in the LDCs.	Mississippi State University	6/30/66 - 6/29/68	50,000
19. Control of weeds in the LDCs.	Oregon State University	6/30/66 - 6/30/69	478,415
		Subtotal	$12,661,643
Completed Projects			
20. History and current status of arid lands research in the U.S.	American Assn. for the Advancement of Science (thru NSF grant, in part from A.I.D.)	6/30/62 - 4/30/64	40,000
21. Land tenure and reform in Puerto Rico.	Economic Research Service, USDA	1/1/62 - 6/30/64	60,000

Substantive Area and Project Title	Contractor	Duration	Obligations (Thru 6/30/66)
A. Agriculture and Rural Development - Cont'd			
Completed Projects - Cont'd			
22. Study conference on means to increase agricultural productivity in underdeveloped countries.	Center for International Studies, M.I.T.	5/29/64 - 2/1/65	$ 146,200
23. Appraisal of the administration of technical assistance programs, with special reference to T.A. in agriculture.	Syracuse University	6/26/63 - 6/25/66	355,475
24. Mapping of research requirements for the Food-for-Peace program.	Michigan State University	6/29/64 - 12/31/65	124,040
		Subtotal	$ 725,715
		Total	$13,387,358

a/ Funding for approximately first three years.

b/ Funding for approximately first two years.

c/ Funding for approximately first three years.

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Research Program

Date: September 13, 1966

Current Monitor: John R. Wilson
TCR/ARDS
~~AID/CSD~~

PROGRESS REPORT

Project Title: Analysis of Data on the Nutrient Status of Soils in Latin America (International Soils Testing Project)

Contractor (or U.S. Agency): North Carolina State University at Raleigh

Origin : Solicited [X] Unsolicited [ ]

Status : Active [X] Completed [ ]

Duration: Date of initiation June 25, 1963

Date of completion (Actual or estimated) June 30, 1968 (Plans are being made to expand this project and extend it for five additional years.

Cost : Total (Actual or estimated) $980,000 (for present contract)

Obligations (through 6/30/66) $980,000

Project Summary

Objective: As a capital investment of over $5.0 billion would be required to build plants to manufacture all the fertilizer required in Latin America by 1080, and since little was known as to the requirements for fertilizer elements to produce good crops, or the response to fertilizers by crops in Latin America, this project was designed to determining what fertilizer nutrients were required, where they were required, how much was required, and what response could be expected from their use.

Description: Four U.S. soil scientists are working in Latin America (Brazil, Costa Rica, Guatemala, and Peru), and four others work there part time, building up the soil testing capability of the local institutions. They work in 16 model soils laboratories in 16 countries, developing standardized testing procedures, determining plant response to fertilizers, and training local people. The capacity of the local laboratories is being increased, new equipment for multiple testing has been designed and is in use, and a new method of establishing fertilizer-plant response relationships has been developed. The data so far collected are being put on maps and charts. Some of the information developed is being used now by the host governments for planning purposes.

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RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Analysis of Data on the Nutrient Status of Soil in Latin America (International Soils Testing Project)

2. Contractor: North Carolina State University at Raleigh - Contract No. AID/csd-287

   Principal Investigator: Dr. J. W. Fitts, project director

3. a. Date of Signing Contract: June 25, 1963

   b. Funding: (Obligations)
   FY 1963 - $750,000 (for 3 years)
   FY 1966 - 230,000 (for 2 years to completion of present contract) Note: It is anticipated that this project will be expanded to the other regions upon request from the missions and countries. This will require funding to cover expenditures at a level of about $275,000 annually.

   c. Amendments: (5)

      (1) Amendments No. 1 through 4 established annual firm budgets for the project, revised personnal requirements, and personnel terms of service and benefits, abolished the African portion of the project, and authorized a control laboratory in Raleigh, North Carolina.

      (2) Amendment No. 5 increased the fund obligation and continued the project to June 30, 1968.

4. Project Monitors:

   a. TCR/ARDS Technical Monitor

      (1) Dr. Frank W. Parker - From start of project to October 14, 1964

      (2) Dr. David G. White - October 14, 1964 to October 1, 1965

      (3) Mr. John R. Wilson - October 1, 1965 to the present

   b. MR/CSD Contract Officers: (chronological order)

      Julius Kessler
      Cordell Roller
      John Curran

Cordell Roller
Raymond Torrey

5. Origin of the Project: Latin America and Africa were faced with the problem of doubling agricultural production in twenty years or less if the per capita food supply in each area was to be adequate. It was realized that much of the required increase would depend on using more fertilizer, but information was lacking as to the fertility of the soils in each ergion, the kinds of fertilizers needed, and crop response to fertilizers. The office of HRSD (Dr. Frank Parker) drafted a preliminary proposal for research to establish the nutrient status of Latin American and African soils late in 1962. This proposal was studied in detail by an ad hoc agricultural research committee composed of representatives from the USDA/ARS, industry, and the land grant colleges. Suggestions were made for broadening the scope of work, and the Soils Department of North Carolina State University at Raleigh was asked to prepare the final draft of the proposal.

II. Evaluative Information

6. Description of Project:

a. It is estimated that the consumption of fertilizer plant nutrients in Latin America should increase from about 0.8 million tons in 1960 to 5.4 million tons in 1980. Little is known as to the kinds of fertilizer required, where they are required, or the economics of fertilizer use in Latin America. As a capital investment of over $5.0 billion would be required to build plants to mamufacture this quantity of plant food, it is essential that information be gathered as to the kinds of fertilizers required, the probable response to their use, and the geographic distribution of these requirements as a guide to future fertilizer programs. The original thought was that information already existed that would be helpful in evaluating and estimating regional requirements for fertilizer; but upon examination, it was found that the little information available was sketchy, was based upon varying methods of testing, and in some cases was inaccurate. It was decided that soils testing laboratories would be established in several countries, that uniform testing procedures would be developed, and that the project would provide leadership for a coordinated testing program in Latin America. The contractor's employees work in the cooperating countries through local institutions to (1) establish suitable testing procedures, (2) increase soil testing capacity, (3) correlate soil test and crop response data, (4) identify

the nitrogen, phosphorous, potash, minor mutrient, acidity, and salinity status of the arable soils of each country, and (5) to present their findings in comprehensive reports and maps.

b. Dr. J. Walter Fitts, then head of the Soil Science Department at North Carolina State University at Raleigh, visited most of the countries of Latin America late in 1963 and made arrangements for cooperative work in sixteen countries. In 1964, four technicians were stationed in Brazil, Uruguay, Peru, and Guatemala. In 1965, the man in Uruguay was moved to Costa Rica. The country assignments of the contractor's staff are now as follows:

	Headquarters	Countries Assigned
J. Walter Fitts Project Director	Raleigh, N. C.	all
W. V. Bartholomew	Raleigh, N. C.	all
R. B. Cate, Jr.	Recife, Brazil	Brazil
A. H. Hunter	San Jose, Costa Rica	Costa Rica Panama Nicaragua
J. L. Walker	Guatemala City, Guatemala	Guatemala Mexico Honduras El Salvador
D. L. Waugh	Lima, Peru	Peru Ecuador Bolivia
E. J. Kamprath	Raleigh, N. C.	Colombia
C. B. McCants	Raleigh, N. C.	Venezuela

One position to cover Uruguay, Paraguay, and Argentina is now open, but the work is going on under the supervision of Dr. Fitts, assisted by Dr. Bartholomew. Each of the technicians works in an existing laboratory in each country with space, office help, labor, etc., being supplied by the hosts. Country and Regional advisory committees composed of farmers, industrialists, and scientists have been set up and

have been instrumental in promoting soil testing reform and extension. New equipment for testing multiple samples has been designed and installed in one model laboratory in each country and local technicians are being trained it its use.

7. Contractor Performance: The contractor has supplied superior scientists for this project who have adapted very well to the local conditions. North Carolina State University has made its top people available for consultation and visitation and the former head of the soils department has become full-time project director. The employees have worked well with the USAID Missions of the countries in which assigned and have secured the enthusiastic cooperation of the host governments. The work is slightly behind schedule because of the absence of reliable data mentioned in paragraph 6 (a) above, but the speed with which most of the cooperating countries have built up their soil testing capability and increased the number of tests conducted each year under the leadership of the project staff indicates that the project will probably be completed by July 1, 1968.

8. Evaluation of Results:

a. Major Results: Soils testing laboratories in the U.S. have been used primarily to provide guidance to farmers in the use of fertilizers. Before this study, confidence in this method of providing guidance to farmers or to national planners was lacking since a statistical correlation between fertility tests and crop response to fertilizers in the field had not been well established because: (1) some testing methods were inadequate; (2) the methods used varied from one area to another and were not comparable; and (3) faulty design of some of the statistical studies. These primary limitations have been overcome by this study and it is felt that the results of this study can now be adapted to other tropical and semi-tropical areas such as India, India has about 30 soil testing laboratories in operation which can now begin to use the analytical models developed by this project to map its soil fertility status and fertilizer needs with much greater precision than was possible here-to-fore. In addition, the following accomplishments can be credited to this project.

(1) Sixteen model soil testing laboratories have been established under the project. Brazil has established nine laboratories patterned after its model at Sao Paulo.

(2) Multiple despensing equipment has been designed and built

which has increased the capacity of each laboratory to 100 samples per day compared to 10 or less in 1963. (Most averaged less than 1 sample per day.) The equipment is capable of handling 10 samples and a control simultaneously and is now manufactured in Latin America. A model has just been built capable of handling 100 samples and 10 controls at a time.

(3) It has been found that the phosphorous fixing capacity of many clay soils is very high. Where it was previously thought that P_2O_5 gave no response, it is now known that this element must be banded or otherwise placed so as to reduce fixation. As a result, P_2O_5 gives an excellent response.

(4) A simple, rapid method has been developed for correlating soil test analyses with plant response data to predict the probablity of getting a profitable return from the use of plant nutrients. Based on a relatively few soil tests and field trials in which economic optimum amounts of the different plant mutrients are used, it indicates which nutrients are limiting and the level of soil fertility necessary to produce a profitable crop.

(5) Using the above method, it has been found that Paraguay can profitably use about 15,000 tons of fertilizer to increase production in the areas where soil tests have been made(between 10% and 15% of the country).

(6) A soil map of Brazil prepared under the project shows that large areas will respond to lime application and evidence is beginning to indicate shortages of zinc and sulphur.

(7) Soil testing for farmers is proving to be an excellent device for coordinating the efforts of research and extension personnel and it brings the results of research directly to the farmer's field.

(8) This project has been very effective in promoting regional cooperation among the Latin American countries, in leading these countries to expand their own efforts, and in promoting the various USAID country objectives.

(9) Regional advisory committees have been appointed for each region.

(10) An advisory committee has been appointed for the project as a whole composed of three industry representatives and two university representatives (Auburn and Cornell).

(11) A control laboratory has been set up at Raleigh to assist in solving special problems and to test country samples as a check on procedures and accuracy.

(12) Two bulletins have been published and distributed:

(a) "A Rapid Method for Correlation of Soil Test Analyses with Plant Response Data" (English, Spanish, and Portuguese)

(b) "Evaluation of Soil Fertility in Latin America: Soil Testing - Plant Analyses" (English, Spanish, and Portuguese)

(13) Two training schools have been conducted at Raleigh with the expenses of most of the participants (80) being paid by their own government or by local industry.

b. Professional Evaluation of Results

The contractor has made progress in setting up laboratories and in training personnel for this important work. Their relationships with other U.S. and local institutions have been excellent and the quality and quantity of work is superior.

c. Description of Known Uses

The publication mentioned above and the testing techniques adapted by the contractor to local conditions are now being used in all of the model laboratories and are being adopted by others. The maps prepared for Brazil are in use by the government for planning purpose. Equipment designed by the technicians working under the contract is now in use in all the model laboratories and in several other laboratories. Several of the missions have commented on the usefulness of this project to country programs. USAID/ Uruguay says "N.C. State assistance in soil fertility

trials and soil testing regarded as highly useful in view of expanding activity in use of fertilizers---" (TOAID A293, 5/17/66). USAID/Venezuela reports, "This service (this project) should continue for a least another year."
"Local institutions --- are making use of services--- also doing some soil testing for farmers" (TOAID A 553, 5/20/66). Thirteen of the 16 countries in which this project is being conducted responded to a query as to the project's usefulness with airgrams similar to the above quotations.

9. Plans for the Future: Work will continue on developing data and preparing maps and reports. Five bulletins are under preparation - two have been approved for publication -- and additional country maps are being prepared. Plans are being made to amend this contract to provide similar services to countries in other regions. Nineteen USAID missions in the FE, NESA and AFR regions have indicated a desire to participate in this project. Two countries in the LA region not now included have also asked to be considered for inclusion. Thus the competence to conduct research on humid tropical soils built up under this research contract will not be lost to the agency but will be kept intact to provide assistance on a worldwide basis.

Signed: _____
Monitor

Approved: _____
Director, TCR/ARDS

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Research Program

Date: 9/13/66

Current Monitor: Mr. John R. Wilson
TCR/ARDS
~~or PG/~~

PROGRESS REPORT

Project Title: Development and Use of Improved Varieties of the Major Cereals in Africa

Contractor (or U.S. Agency): USDA/Agricultural Research Service

Origin : Solicited [x] Unsolicited [ ]

Status : Active [x] Completed [ ]

Duration: Date of initiation April 16, 1963

Date of completion (Actual or estimated) June 30, 1968 was the completion date set in the PASA but it was stated that the project would probably run to June 30, 1973.

Cost : Total (Actual or estimated) $1,895,325 to June 30, 1968

Obligations (through 6/30/66) $905,125

Project Summary

Objective: To develop varieties of maize, sorghum, and millet adapted to African conditions, to improve the methods of cultivation used for these important crops so that the yield and quality of the grain produced are both materially raised, and to improve the regional capability for conducting adaptive research.

Description: Nine USDA/ARS scientists are working in two regional institutions (Scientific, Technical, and Research Commission of the Organization for African Unity and the East African Agriculture and Forestry Research Organization) with local scientists, developing new varieties adapted to African conditions, new methods of cultivation adapted to the capability of the African farmer, and new insect, disease, and weed control techniques that can assist in increasing the yield and improving the quality of the sorghum, maize and millet grown in Africa. Local breeding stock is being evaluated, new varieties are being introduced, and local people are being trained on-the-job. A local seed company is now producing hybrid seed to plant about 0.5 million acres of maize in 1967 and will start producing hybrid sorghum seed in 1967 or 1968.

UNCLASSIFIED

Draft
9/9/66

RESEARCH PROJECT PROGRESS REPORT

I. Project Description

1. Name of Project: Development and Use of Improved Varieties of the Major Cereals in Africa.

2. Contractor: USDA/Agricultural Research Service, PASA No. RA-4-00.

   Principal Investigator: Dr. George F. Sprague is the Project Director and Dr. O. J. Webster is the team leader in Africa (Zaria, Nigeria).

3. a. Date of Signing PASA: April 26, 1963.

   b. Funding:

	(Obligations)
FY 1963 -	$146,625
FY 1964 -	170,000
FY 1965 -	270,000
FY 1966 -	318,000
FY 1967 -	490,700 (Requested)
FY 1968 -	500,000 (Estimated)

   (Note: This was originally expected to be a ten year project. It is now anticipated that it will take at least until 1971 or 1972 to complete the work and that funding at a level of about $450,000 annually will be required after FY 1968.)

   c. The PASA has been amended each year to provide funding. In FY 1966, Amendment No. 4 was issued to complete funding for FY 1966, and to provide for a survey leading to research on methods of preparing sorghum for human consumption suitable for use in Africa.

4. Project Monitors:

Dr. Frank W. Parker - April 16, 1963 to August 14, 1964
Dr. David G. White - August 14, 1964 to November 4, 1965
Mr. John R. Wilson - November 4, 1965 to present

5. Origin of the Project: The project originated in conversations held between Dr. Frank W. Parker, AID/TCR, Dr. Marion W. Parker, USDA/ARS, Dr. Hosea Valega of FAO, and others in early 1962. The African Missions, the Rockefeller Foundation, FAO, USDA/ARS research personnel, several University research people and others were asked to comment on the idea of a research project on "Maize, Millet and Sorghum." On January 10, 1063, the USDA/ARS submitted a proposal, and on February 11, 1963, it was discussed and revised in a meeting involving personnel from A.I.D., the Rockefeller Foundation, the University of Nebraska, the Oklahoma Experiment Station and the U.S. Department of Agriculture.

Evaluative Information

6. Description of the Project:

a. The objective of this project is to develop varities of maize, sorghum and millet adapted to African conditions and to improve the methods of cultivation used for these important crops so that the yield and quality of the grain produced are both materially raised and to improve the regional capability for conducting adaptive research. Sorghum, maize and millet are the basic food crops in much of Africa; sorghum and millet being grown in the tropical dry areas and maize in the more temperate areas. They are grown as subsistence crops and the yields are very low. The objectives of this project are to increase the yield and quality of these three major

cereal crops through: (1) breeding and selection of improved varieties adapted to the African environment; (2) development of suitable pest control measures including the development of bird, insect and disease resistant varieties; and (3) development of improved cultural management practices. As added objectives, the USDA team is to train local scientists, develop long term, regional, breeding and crop improvement research programs, and assist in introducing the new technology to farmers. The regional pattern for the project was developed to foster cooperation between scientists in Africa and to make the optimum use of the limited resources available. To attain the objectives, a team of USDA scientists (plant breeders, geneticists, pathologists, soil scientists, entomologists and agronomists) are stationed in East and West Africa. They work with the world collections of the major cereals, plus local acquisitions, to find, identify and incorporate promising lines and strains into the breeding program. Experimental work includes screening the world collections and local varieties for desirable characteristics, testing and adapting methods of insect and disease control, and developing methods of cereal cultivation which can be used with profit by the local farmers.

b. The work is being done in Nigeria, Uganda and Kenya where the U.S. scientists collaborate with local agronomists and work in local and regional institutions. Because of the different ecological conditions, the techniques of cultivation available to the farmer, and the ultimate end use of the grain produced (human food), the varieties and cultural practices used in the U.S. are unsuitable for use in Africa. However, the principles of grain breeding and crop production developed here are

applicable to the area so that much of the research being conducted is adaptive rather than basic. Agreements have been executed with STRC (Scientific, Technical and Research Commission of the Organization for African Unity) which coordinates the work in West Africa and EAAFRO (East African Agriculture and Forestry Research Organization) which fulfills the same function in East Africa. Both organizations take the responsibility for the dissemination of information and seeds throughout much of Africa and support the research work by supplying scientists, technicians, labor, land, offices, etc. The U.S. scientists now working on this project are shown below, along with their post, position and date of arrival at post:

Name	Location	Position	Date Posted
O. J. Webster	Zaria, Nigeria	Agron.-Geneticist	Sept. 1964
M. Futrell	Zaria, Nigeria	Pathologist	Sept. 1964
O. York	Zaria, Nigeria	Entomologist	Feb. 1966
K.R. Stockinger	Zaria, Nigeria	Soil Scientist	Mar. 1966
A. Kosage	Kaduna, Nigeria	Admin. Officer	July 1965
J. Craig	Ibadan, Nigeria	Maize Path.-Brdr.	Oct. 1965
S.A. Eberhart	Kitale, Kenya	Maize Geneticist	July 1965
* A.J. Cassady	Serere, Uganda	Millet Geneticist-Agronomist	Aug. 1965
G.A. Shumaker	Serere, Uganda	Soil Scientist	April 1966
Vacant	Serere, Uganda	Entomologist	-

* Dr. Cassady was medically evacuated to the U.S. in February, 1966 and has not been replaced as yet.

Work on sorghum and millet is conducted at Zaria (Agricultural Research Institute, Ahmad Bello University) Nigeria and Serere, Uganda (Agriculture Research Station) while the research

on maize is being done at Ibadan, Nigeria (Moor Planation, an agriculture research station) and Kitale, Kenya (Maize Research Center). The USDA supplies the personnel shown above, seed and a limited amount of equipment. The local institution makes available other equipment, labor, land and local scientists to support the project. The U.S. personnel on this project travel extensively in the area, training local technicians and assisting in country cereal research programs.

7. USDA/ARS Performance: The calibre of people posted on this project has been extremely high but recruiting sometimes has been slow, both because of a lack of housing at the post and because of the unavailability of qualified people. The scientists have been accepted by their counterparts very well and the reports from the Missions and countries have been very favorable. Most of the problems encountered have been of an administrative nature. Through FY 1965, the total budget was allotted to the USDA which had difficulty in paying local costs in the cooperating countries. In FY 1966, part of the budget was reserved to the USAID Missions for local payments.

8. Evaluation of Results:

a. Major Results:

Improved strains of sorghum exhibiting yield increases of 20% and over have been obtained. Several thousand nursery and yield test plots are devoted to testing these varieties for local adaption. A program has been started for development of male sterile sorghum lines and fertility restoring lines for the production of hybrids. The World Sorghum Collection

(5000 varieties) is being grown and evaluated for resistance to diseases and insects. The Kenya Seed Company is making plans to start hybrid sorghum seed production as soon as suitable parents have been identified and isolated.

The World Millet Collection (over 2000 varieties) has been grown in observation plots. The more promising lines are being evaluated for yield, insect and disease resistance and other desirable agronomic characters and are being increased and tested in the regions. The most disease resistant lines are being crossed with adapted types to combine disease resistance and high yield.

Conventional double-cross hybrids (involving four inbred lines) were used at the start of the Maize program, but now inter-varietal hybrids (crosses between two varieties; two hybrids; or a variety and a hybrid) between some of the better local varieties and a Central American variety are yielding 50 to 100% more than the local varieties compared to a 25% to 30% increase in yield for the conventional hybrids. Continued selection within the parent varieties should further increase the yields of the inter-varietal hybrids developed during the next few years. Inter-varietal crosses now account for the bulk of the hybrid maize seed being sold in Kenya.

Most of the hybrid seed corn produced in Kenya is grown by the Kenya Seed Company, a small private seed company specializing in grass seed production before 1962. In that year, it was induced to plant about 3 acres to hybrid seed corn.

From this small beginning, it has grown rapidly, although it has never been able to meet the total demand. Below are the acreages of corn planted using hybrid seed sold by this company:

Year	Approximate Acres Planted by Farmers
1963	400
1964	30,000
1965	70,000
1966 *	112,000
1967 **	500,000 (Estimated)

* Production of inter-varietal hybrid seed corn started in 1965 and was sold in 1966.

** The estimates for 1967 are derived from seed production estimates of seed being produced in 1966.

It is interesting to note that well over half of the hybrid seed produced is being used by the small-scale farmers.

The hybrid maize seed program in Kenya is unique in that seed is sold as a part of a "package" which includes fertilizer, plant protection and improved cultural practices -- which has caused the farmers to receive very high yields and has led to the acceptance of hybrid maize as a "new crop."

Two professional articles have been published. "Ergot Infection and Sterility in Grain Sorghum" reports that under this project it has been found that floret sterility, often associated with ergot disease, is not caused by the pathogen; the

pathogen attacks flowers only when they are not pollinated. Thus, the disease can be controlled by having an abundance of pollen available when the florets become receptive or by breeding resistance to the disease into the locally adapted varieties. Both courses of action are being followed.

The second article reports on the finding of a new yellow endosperm millet. The yellow color is due to a carontenoid pigment and presumably has pro-vitamin A potency. As millet is the important food crop of the area, this new type can have important nutritional value. Studies are underway to determine the inheritance of this color and to determine if it can be introduced into the standard varieties used for food.

Two regional conferences were held, one at Zaria, Nigeria, with 11 African countries represented, and one at Kitale, Kenya with 9 countries represented, where programs were reviewed and plans were made for the exchange of breeding stocks and a cooperative testing program.

An in-service training program has been started with scientists from the African regions receiving from two months to a year's training in one or more of the disciplines concerned with cereal breeding.

b. Professional Evaluation of Results:

The work done has been superior and the USDA team has established excellent relations with the host countries and Missions and has been a major factor in promoting intra-regional cooperation

between the plant breeders and other agricultural scientists of Africa.

c. Known Uses of Results:

The results of the maize research are being extended very rapidly. In 1965, enough hybrid seed was produced to plant 120,000 acres, over half of which was used by small farmers. Enough seed is being produced in 1966 to plant over 0.5 million acres.

The lines of sorghum found to be resistant to blight and headsmut are being used in country breeding programs and it is expected that hybrid sorghum seed production will start within the next two years, using some of this improved breeding material.

Breeding stocks are being exchanged among the 20 countries whose representatives attended the seminar mentioned above.

9. Plans for the Future:

It is planned to incorporate a program on "processing sorghum for human consumption" into this project. A survey has been made and the final report is expected in September of 1966. Greater emphasis will be placed on cereal production at the farm level and the Missions have indicated an interest in concentrating the attention of their host country's plant breeders and extension service on the results of this project for local adaptation and dissemination to farmers.

Material containing high lysine and high protein from the Purdue research project will be incorporated in the sorghum breeding program, starting in the winter, 1966-1967.

An amendment to continue the PASA in FY 1967 is under review and the project is expected to continue at least until 1971 or 1972.

Signed: _____
Monitor

Approved: _____
Director, TCR/ARDS

DRAFT

Research Program

Date: 9/12/66

Current Monitor: Dr. D. G. White
TCR/ARDS
or=RS/

PROGRESS REPORT

Project Title: Improvement of grain legume production in the Near East-South Asia and Far East regions

Contractor (or U.S. Agency): USDA/Agricultural Research Service- PASA No.RA-3-00

Origin : Solicited [x] Unsolicited [ ]

Status : Active [x] Completed [ ]

Duration: Date of initiation June 25, 1963

Date of completion (Actual or estimated) It is expected that project will be extended to Africa in FY 1967 and to the Far East in FY 1968

Cost : Total (Actual or estimated) $1,520,300 (Thru FY 68)

Obligations (through 6/30/66) 569,500

Project Summary

Objective: To increase the yields and to enhance the quality of major grain legumes, especially such pulses as dried beans and peas, which are often the only source of high quality protein available to supplement the cereals for human food in many Asian and African countries.

Description: Very little research has been done toward varietal improvement or of cultural practices of the grain legumes in the LDCs. Teams of USDA scientists (including plant breeders, soil scientists, entomologists and plant pathologists) have been posted in Iran and India. Experiments are conducted in collaboration with host country agricultural institutions on the breeding of superior hybrids of pulses, testing yields under different soil and water conditions, and identifying major insect pests and developing control measures.

Although progress has been made towards increasing the yields of pulses in a few selected areas, it is premature to expect results sought to be of widespread significance.

DRAFT 9/8/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Improvement of grain legume production in the Near East-South Asia and Far East regions.

2. Contractor: USDA/Agricultural Research Service - PASA No. RA-3-00

   Principal Investigators: Dr. August E. Kehr, Chief, Vegetables and Ornamentals Research Branch (Beltsville) and Dr. Peter van Schaik, Project Leader (Tehran)

3. Date of Initiation: June 25, 1963

   Funding:

FY-1963	$2,000	
FY-1964	32,000	
FY-1965	173,500	
FY-1966	362,000	
FY-1967	347,800	(Requested)
FY-1968	400,000	(Estimated)

   During FY-1966 USAID/India provided an additional $55,000 in rupees for local costs and has agreed to provide the equivalent of $148,000 in Rupees for FY-1967.

4. Project Monitors:

   Dr. F. W. Parker - June 25, 1963 to August 14, 1964
   Dr. D. G. White - August 14, 1964 to November 4, 1965
   Mr. J. R. Wilson - November 4, 1965 to February 2, 1966
   Dr. D. G. White - February 2, 1966 to present

5. Origin of the Project: Developed through conversations between Dr. F. W. Parker, AID/TCR, and Dr. Martin G. Weiss, Assistant to the Deputy Administrator of Farm Research, USDA/ARS.

II. Evaluative Information

6. Description of Project:

   a) Grain legumes, especially the pulses like dried beans and peas, are the major sources, and often the only source, of high quality protein available to supplement the cereals for human food in many Asian and African countries. Unfortunately,

the yields of the pulses, or grain legumes, in these countries are very low (less than ¼ of U.S. average yields) because of inherant varietal characteristics and poor cultural practices. In spite of the importance of the grain legumes in the LDCs, both from the dietary as well as the economic point of view, very little research has been done which would lead to either varietal improvement or the improvement of cultural practices. The objective of this project is to increase the yields and enhance the quality of pulses. To attain the objective, teams of USDA scientists (including plant breeders, soil scientists, entomologists and plant pathologists) have been posted in Iran and India. In these locations they conduct experiments with major species of pulses in collaboration with host country agricultural institutions. Experimental work includes: (1) the collection and screening of all available world-wide pulse varieties to be followed by breeding and selection of superior hybrids; (2) tests comparing yields from pulses planted at different times and at different population densities; (3) determination of soil nutrient and water requirements and response to fertilization; (4) response to soil inoculations and use of herbicides; (5) identification of major insect pests and development of control measures; and (6) identification of major pathological pests and development of control measures.

b) The Project Leader arrived in Tehran in August 1964 and was joined by six U.S. colleagues during the ensuing year. Seven junior Iranian scientists are assigned to the project, which operates cooperatively with the Karaj Agricultural College and the Ministry of Agriculture. Office space and other help are provided by USAID/Tehran. The College supplies field and laboratory space and the Ministry supplies land for field tests in 10 locations representative of different environments. In December 1965 a USDA plant breeder was posted in New Delhi, followed by a pathologist the next month. A soils scientist will join them in August 1966 and one of the two entomologists now in Iran will move to India about October 1966. The Project Leader will move to India about September 1967 and a biochemist for India is under recruitment. The work in India is performed at the Indian Agricultural Research Institute in New Delhi and two counterpart scientists have been provided as well as office, laboratory, and field space. In addition, USAID/India issued a PIO/T in FY-1966 to provide rupees to cover local costs; continuation of rupee support is anticipated. It is proposed that the work in India will be extended to three agricultural universities: Pant

Nagar, U. P.; Ludhiana, Punjab; and Rajendranagar, A. P. The Project Leader also has travelled extensively throughout the other Near East countries in behalf of the project and has established good liaison with their scientists which will lead to the adoption of experimental results throughout the region. Extension into the Far East and Africa is contemplated about FY-1968 or sooner if requested.

7. Contractor Performance

The contractor has supplied competent scientists who have adapted themselves well to the foreign environments. Their research program is possibly about six months behind the contemplated schedule because of difficulties in recruitment in the early phases of the project. A major problem during FY-1965 concerned disbursement of local currency costs in Iran. All funds had been transferred to the USDA, but subsequently it was discovered that the USDA could not conveniently change dollars into local currency. This problem was solved by issuing a "split" PIO/T, whereby dollars were transferred to the USDA to cover only dollar costs and a lesser sum of dollars was made available to the Tehran Mission to cover local currency costs. In India local costs were covered by their PIO/T issued at the inception of the work. During February 1966 the Project Monitor and the Project Director visited both locations and found that excellent progress had been made and that no modifications of the research plans were required. The relationships between A.I.D. and the PASA team have been and continues to be properly collaborative.

In both locations there is need for more greenhouse, office, and laboratory facilities. In addition, the Iraniana need to provide more senior professional counterparts. Fortunately, the Plan Organizations in both Iran and India are in the process of providing for the correction of those deficiencies.

8. Evaluation of Results:

a) Major results:

Thus far most work has been accomplished in Iran where 8,083 strains, selections or new introductions of pulses were tested in 1965. These observation trials included chickpeas, mungbeans, dry beans, lentils and southern peas planted at 11 different locations. In addition 518 strains selected in 1964 for desirable characteristics were grown in statistically designed yield experiments in 1965. Based upon yield, grain quality, resistance to insects and diseases, and

other characteristics, superior selections were planted in the spring of 1966. As a result of this work, a variety of chickpea from Cyprus has been found to yield 40 percent more than locally-grown varieties when grown under similar conditions and a variety of southern pea (cowpea) from Lebanon yielded 21 percent more than the local varieties. Weevil damange to different dry pea varieties grown in the same field varied from 3 to 22 percent,which indicates that there is a possibility of selecting and breeding varieties resistant to weevils. Similarly, losses in chickpea varieties caused by the corn earworm varied from 2 to 18 percent in the tests and losses as high as 78 percent have been observed in farmers fields. This is the first report that genetic resistance to the corn earworm may exist in the chickpea. The possibility of breeding for resistance to it is most encouraging. The soil scientists have found that where pulses have been grown previously, there is no measurable advantage in inoculating the seed because the organisms responsible for nodulation are present naturally. (Nodules on the roots of legumes are produced by symbiotic bacteria which utilize atmospheric nitrogen, thereby reducing the need for nitrogen fertilizer and also enriching the soil upon decay of the legume roots.) They have found also that in alkaline soils typical of the Near East-South Asia area, phosphorus is the key element required for legumes and zinc is deficient in many areas. Experiments conducted at Beltsville as a part of this project identified several herbicides which could be used for the control of weeds in pulse crops. These results are expected to be applicable to foreign plantings also.

b) Professional Evaluation of Results

In the time involved, the USDA team has made remarkable progress toward the objective of increasing the yields of pulses adaptable in the Near East-South Asia region.

c) Description of Known Uses

A seminar involving extension people from Iran and plant breeders from the other countries in the area was held in early August 1966 to introduce the findings of this project. A few practices such as better seed, the use of fertilizer and better water control are being used by farmers near Kiraj. Otherwise, it is premature to expect results of this project to be in general use.

9. Plans for the Future

An amendment to continue the PASA in FY 1967 is under preparation. In this type of biological research a minimum of five years, and possibly ten, is necessary to achieve the objective thoroughly.

It is expected that the project will be extended to Africa in FY 1967 and to the Far East in FY 1968. As results of this program become available in the form of improved varieties and new information on cultural practices, they will be incorporated in cooperating country production programs and will be made available to other countries having similar ecological conditions.

Signed _____
Monitor

Approved _____
Director, TCR/ARDS

DRAFT

Research Program

Date: 9/12/66

Current Monitor: Dr. D. G. White
TCR/ ARDS
~~OR=BO~~/

PROGRESS REPORT

Project Title: Research on the sterility method of tsetse fly control

Contractor (or U.S. Agency): USDA/Agricultural Research Service - PASA No. RA-1-00

Origin : Solicited [x] Unsolicited [ ]

Status : Active [x] Completed [ ]

Duration: Date of initiation June 14, 1963

Date of completion (Actual or estimated) It is expected that project will be extended beyond June 30, 1968, the present expiration date

Cost : Total (Actual or estimated) $1,068,540

Obligations (through 6/30/66) 541,340

Project Summary

Objective: The principal objective is to determine if the sterility method of insect control, developed and successfully used by the USDA to eradicate some insects, can be adapted for the control or possible eradication of the tsetse fly.

Description: Vast areas of arable land in Africa are not utilized because of infestation of tsetse fly species, which affect both human and livestock. The research methods focus on: (1) methods of rearing tsetse flies; (2) inducing of sterility and controlling release of flies; and (3) measuring results of methods employed. Major research is being carried out in collaboration with the Agricultural Research Council of Central Africa.

The results thus far, while encouraging, are premature for use by Missions in host countries.

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Research on the sterility method of tsetse fly control.

2. Contractor: USDA/Agricultural Research Service - PASA No. RA-1-00.

   Principal Investigators: Dr. E. F. Knipling, Director of the USDA/ARS Entomology Research Division (Beltsville) and Dr. David A. Dame, Investigations Leader posted in Salisbury, Rhodesia.

3. Date of Initiation: June 14, 1963.

   Funding:

FY-1963	$ 3,500
FY-1964	$164,340
FY-1965	$162,000
FY-1966	$236,000
FY-1967	$252,700 (Requested)
FY-1968	$250,000 (Estimated)

4. Project Monitors:

   Dr. F. W. Parker - June 14, 1963 to August 14, 1964
   Dr. D. G. White - August 14, 1964 to present.

5. Origin of the Project: The need for such a project became apparent to Dr. E. F. Knipling, USDA/ARS, during two trips to Africa as an AID consultant on Tsetse fly control. He prepared the preliminary plans which were then discussed with Dr. W. S. Middaugh, AFR/ID, and Dr. Frank W. Parker, TCR/ARDS. The final project proposal was developed as a result of these discussions.

II. Evaluative Information.

6. Description of Project

a. Vast areas of arable land in Africa are not utilized because of infestation by tsetse fly species that are vectors of trypanosomes (blood parasites) which affect both humans and livestock. The principal objective of the project is to determine if the sterility method of insect control, developed and successfully used by the USDA to eradicate other insects, can be adapted for the control or possible eradication of the tsetse fly. The hypothesis underlying this biological method is that the sustained release of sufficient numbers of sterile male flies into an infested area will decimate and eventually result in eradication of the natural population. An applicable technique could be used advantageously by 22 African nations where the tsetse fly infests more than three million square miles.

The research methods focus on: (1) development of economical and effective methods for rearing tsetse flies; (2) inducement of sterility by the use of chemical treatments; (3) identification of attractants which might be used in the field; (4) measurement of the behavior of predominant tsetse species under natural conditions; (5) determination of migratory habits and distribution of the fly during different seasons and in various types of vegetation; and (6) demonstration of the sterility techniques applied in an isolated area infested by tsetse flies.

b. Following an extensive survey of African countries in which the tsetse fly is a major problem, the USDA

recommended that this research project be carried out in collaboration with the Agricultural Research Council of Central Africa (ARC) headquartered in Salisbury, Rhodesia. The ARC is responsible for performing research especially useful to Rhodesia, Zambia, and Malawi. In addition to fiscal support from each of these countries, the ARC receives substantial assistance from the United Kingdom. It was selected as the collaborating institution because the physical and scientific resources which they agreed to make available for the project were better than elsewhere in Africa. The Investigations Leader, accompanied by a technician, arrived in Salisbury December 24, 1963. Subsequently the USAID Mission in Salisbury was closed and thereafter the USDA personnel were assigned to the U.S. Agricultural Attache for administration.

A special laboratory building, constructed and equipped from project funds, was erected in the ARC compound adjacent to their "guinea pig" building. The ARC furnishes and maintains a large number of guinea pigs which are used as the source of food (blood) for caged tsetse fly experiments. These experiments include (1) the testing of different candidate chemosterilants, (2) determination of the longevity of chemosterilation, and (3) the mating competitiveness of sterile males. Flies used in the laboratory work are obtained from massive numbers of pupae sifted from the soil in infested "bush" by Africans under the direction of ARC. In addition Rhodesia made available about 3,000 acres of tsetse fly infested virgin forest bordering the Zambezi River for a field station. Using project funds, the ARC has developed the physical facilities and supplied the staff to support the following experiments at the field station:
(1) measurement of the physiological behavior of the predominant tsetse fly species under natural

conditions; (2) determination of migratory habits and distribution of the tsetse during different seasons and in various types of vegetation; and (3) development of techniques for rearing massive numbers of male flies which could be sterilized prior to release in the field. Three ARC professionals, plus 75 to 100 laborers, live at the field station where more than 100 head of cattle and almost that many sheep are maintained as the source of food for rearing flies and also as attractants for capturing them. In addition, Rhodesia has furnished an isolated island in Lake Kariba for use in a pilot eradication test. The island is about three miles long and a half-mile wide, covering a total of about two square miles. It is inhabited by wart hogs, kuda and other antelopes which serve as hosts for an existing tsetse fly population. Following an intensive study of the fly on this island, the scientists propose to release large numbers of sterilized males successively with the expectation that the natural population will be eradicated.

7. Contractor Performance

The contractor and the ARC have supplied competent scientists who have adapted themselves well to the environment. The research program is progressing at the rate contemplated. The problem of rearing flies in massive numbers has proven difficult, as had been predicted. For this reason, an ARC scientist has been added to work primarily on the problem of developing a specific attractant which could be treated with a chemosterilant and distributed in the field to effect sterilization of natural populations. (The attractant might be similar to a bait or it could be a mechanical device emitting sounds or perhaps a certain wave length of light which would attract tsetse flies.)

The Unilateral Declaration of Independence by Rhodesia in the fall of 1965 raised the issue of whether or not this project could be continued there with A.I.D. support. Since Zambia, Malawi, and the United Kingdom continued to support ARC, however, the Agency, with the concurrence of the State Department, also decided to continue support of this project in Rhodesia, providing the USDA personnel were not in personal danger. To date there has been no change in the situation which would warrant reconsideration of this decision.

8. Evaluation of Results

a. Major Results

In addition to semi-annual progress reports submitted to A.I.D., project personnel have authored the following publications:

Smith, Carroll N. and David A. Dame 1963. Chemosterilization -- a new field of research in tsetse fly control. Bul. Epis. Dis. Afr. II: 403-414.

Dame, David A., Godfrey J. W. Dean, and John Ford. 1964. Investigations of the sterile male technique with Glossina morsitans. Proc. 10th Mtg. International Sci. Committee for Trypanosomiasis Research: 93-96.

A third report has been prepared for publication:

Dame, David A. and Hugh R. Ford. Effect of the chemosterilant tepa on Glossina morsitans Westwood.

The principal findings include: (1) male flies have been successfully sterilized by exposure to inexpensive compounds called tepa and metepa; (2) treated males inseminate females but consequent embryos abort at an early stage; (3) sterilization with tepa or metepa apparently does not affect the longevity or agressiveness of males; (4) optimum environmental conditions for rearing flies have been established; (5) the island in Lake Kariba is indeed free of fly migration from the mainland; and (6) the fly population and their reproductive status on the island have been determined during different seasons (the latter information is essential for selecting the optimum time for the initiation of the pilot eradication test).

b. Professional Evaluation of Results

These findings are important basic contributions to knowledge necessary to achieve the objective of the project; they manifest the competence and diligence of the project staff.

c. Description of Known Uses

The results thus far, while very encouraging, are premature for use by Missions or host countries.

9. Plans for the Future

An amendment to continue the PASA in FY-1967 is under preparation and it is expected that the project will be extended beyond June 30, 1968, the present

expiration date. The Food and Agriculture Organization of the United Nations has indicated an interest in extending the results of this basic research to other African nations by supporting research to adapt the findings of this project to other areas.

Signed _____
Monitor

Approved _____
Director, TCR/ARDS

DRAFT

Research Program

Date: September 13, 1966
Dr. Douglas D. Caton
Current Monitor: Mr. John R. Wilson
TCR/ARDS
~~ARDS~~/

PROGRESS REPORT

Project Title: Research on Farm and Equipment Power Requirements for Production of Rice and Associated Food Crops in the Far East and South Asia

Contractor (or U.S. Agency): International Rice Research Institute (IRRI)

Origin : Solicited ☐ Unsolicited ☒

Status : Active ☒ Completed ☐

Duration: Date of initiation June 28, 1965

Date of completion (Actual or estimated) June 27, 1968 (present contract; extension to 1970-75 probable)

Cost : Total (Actual or estimated) $360,000 (3 years)

Obligations (through 6/30/66) $360,000 (3 years)

Project Summary

Objective: To develop power sources and equipment suitable for wet land rice and related crop production, (2) to compare alternative power sources as to costs and benefits to the cultivator, and (3) to determine the impact of mechanization on farm organization, cropping patterns, and selection of crops.

Description: Power equipment of various sizes and types are to be developed and tested under field conditions. Economic comparisons of fixed and operating costs would then be established to be compared with the technical efficiency determinations of the power units. As feasible types of power equipment are developed, a cropping sequence (and crop combinations) will be calculated for synthesized farms; compared with traditional methods; and the costs and returns compared. The "improved" farm organization will include most effective size and shape of fields for maximum efficiency in cropping, soil and water management, power use, and for reduced costs and increased returns.

DRAFT 9/9/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Research on Farm and Equipment Power Requirement for Production of Rice and Associated Food Crops in the Far East and South Asia.

2. Contractor: The International Rice Research Institute, (IRRI), Los Banos, Laguna, The Philippines, Contract No. AID/csd-834

   Principal Investigator: Loyd Johnson, Agricultural Engineer

3. Date of Initiation: June 28, 1965

   Funding: $360,000 for 3 years

   Note: This project is expected to continue for 5 to 8 years with anticipated expenditures of about $120,000 per year after FY 1968.

4. Project Monitors: Dr. Douglas D. Caton and Mr. John R. Wilson - June 1965 to present

5. Project Origins: The outline of the project was developed by IRRI, based on an evaluation of technological needs of small farms to increase food production. Basic to farm reorganization and more intense cropping is a reliable source of power other than animals, at a cost that small farmers can afford.

   In June, 1965, Douglas D. Caton, TCR/ARDS, Harold Koone, Food and Agricultural Officer, USAID Manila, and Loyd Johnson agreed upon including in the contract a clearer expression of the economic evaluation, i.e.,: (1) to compare alternative power sources as to costs and benefits to the cultivator, and (2) to determine the impact of mechanization on farm organization. cropping patterns, and selection of crops. Also, at the request of IRRI, the contract is being amended to permit faster recruiting and to expedite operations.

II. Evaluative Information

6. Description

   a) The objective of this project is to develop power sources and equipment suitable for wet land rice and related crop production in the LDCs and to determine the economic effects

of its use. Animal and human power on rice farms in the Far East region are generally inadequate for continuous and/or multiple cropping. Increasing the supply of either on small farms is not the solution because of the expense, and the food and feed requirements for draft animals. For these reasons, and because of inefficiencies in use of power from animals and humans compared with power produced by alternate power sources, diminishing returns to additional units of the traditional sources develops quickly. Fitting relatively inexpensive adaptable sources of power to small farm operations, particularly to paddy cultivation on rice farms, is the key to more effective farm organization, and to continuous and multiple cropping. By eliminating feed and pasture requirements of draft animals, more land is available for crops, thereby, helping to increase production of human foods.

To determine the power requirements of typical small farm operations found in the rice areas of the Philippines (typical of the whole Far East), the calendar of operations of various crops must be found. These data will be obtained by a survey of Philippine farmers, and through discussion with well informed individuals. A cross section determination of farm organization and farm sizes, together with the power requirement data, will be used to "synthesize" representative farms. Power equipment of various sizes and types are to be developed and tested under field conditions. Economic comparisions of fixed and operating costs would then be established to be compared with the technical efficiency determinations of the power units. As feasible types of power equipment are developed, a cropping sequence (and crop combinations) will be calculated for the synthesized farms; compared with traditional methods; and the costs and returns compared. The "improved" farm organization will include most effective size and shape of fields for maximum efficiency in cropping, soil and water management, power use, and for reduced costs and increased returns.

b) Adaptive and evaluative demonstration research will then be undertaken in selected areas of cooperating countries in the FE and NESA regions.

7. Contractor Performance:

a) The staff Agricultural Economist of IRRI, who had intended to help with the project, was forced to resign because of family health problems. Contacts were made with both economists and agricultural engineers early in the year and IRRI, in good faith, had informed AID/W of the pending employment of these men. However, two agricultural engineers and at least two agricultural economists declined the positions after informing

IRRI of their intention to join its staff. Both types of scientists are in very short supply around the world and are difficult to recruit for any but the most lucrative positions. Other factors affecting recruitment are (a) the distance of the Philippines from supply sources of potential candidates, (b) the short duration of probable employment, (c) the research experience requirements, (d) the demand on the project leaders time for other tasks (hence the high level of experience requirement), and (e) a number of similar details relating to the general provisions of the contract.

b) IRRI has now informed us that they have hired an agricultural engineer and an agricultural economist, both of whom will be reporting to the Philippines shortly. Other problems relating to the contract have been discussed with Dr. Chandler and Mr. Johnson and the research can now be implemented at a faster rate. Mr. Ray Torrey, MR/CSD, the contract officer, went to the Philippines in August to negotiate several technical points with IRRI and to provide guidance to its staff in meeting contract provisions. A further delay to the work was caused by the fact that it was necessary to negotiate an "exception" for the USDA National Tillage Machinery Laboratory so that it could sub-contract with IRRI to test power equipment, wheels, and tiller tines designed under this project.

c) In spite of the difficulties mentioned, considerable work has been done by IRRI on this project simply because Mr. Johnson's services were available at no cost to A.I.D. (See below)

8. Evaluation of Results: Mr. Johnson has been engaged in Engineering activities directly related to this project during the past year at no cost to A.I.D. He submitted a report on these activities, which was sent to all missions. As a result, India and Guatemala, have asked for further information, and other missions have expressed an interest in the project. It is anticipated that the research will be regionalized because all sections of the Far East have a similar problem.

9. Plans for the Future: The improvements in the contract outlined have been negotiated by Mr. Torrey and an amended contract is being prepared. The staff will be in position soon and as soon as ARDS is informed of their arrival, the project monitor will go to the Philippines to assist in the project implementation. As results of this research become

apparent, reports, blueprints, demonstration models, and other material will be made available to all missions and host countries desiring to cooperate. The project staff will also be available for consultation and assistance. It is expected that 5 to 8 years will be required to achieve the objectives of this project.

Farm mechanization is basic to achieving higher levels of food production. Consequently, this research, which has broad applicability to small farm operations, is of wide regional interest in the Far East, in Africa, and in Central America.

Signed _____
Monitor

Approved _____
Director, TCR/ARDS

DRAFT

Research Program

Date: 9/13/66

Current Monitor: Dr. Douglas D. Caton
Mr. Louis J. Gill
TCR/ ARDS
er-PO/

PROGRESS REPORT

Project Title: Analysis of Factors Associated with Differences and Changes in Agricultural Production in Less Developed Countries

Contractor (or U.S. Agency): USDA/Economic Research Service

Origin : Solicited [x] Unsolicited [ ]

Status : Active [x] Completed [ ]

Duration: Date of initiation May, 1963

Date of completion (Actual or estimated) June, 1969

Cost : Total (Actual or estimated) $2,200,000

Obligations (through 6/30/66) 1,264,545

Project Summary

Objective: The objectives of this project are (A) to analyze existing data in 26 selected countries in order: (1) to determine differences among countries in rates of progress in improving agriculture; (2) to ascertain those factors most commonly associated with high rates on increase in output and productivity; (3) to provide AID with basic information indicating possible means of improving the effectiveness of economic and technical assistance programs in furthering agricultural development of the less developed countries; and (B) to describe through case studies the processes by which less developed countries make the transition from low to higher levels of agricultural output and productivity.

Description: In Phase A, physical, social and economic elements that might explain differences in agricultural production and development patterns were selected from available secondary sources for 26 countries. This information was needed to provide a factual basis for formulating more sharply focused policy guidelines for immediate development assistance programming and to provide a working hypothesis for the intensive country studies undertaken in Phase B.

Phase B studies in Taiwan, Greece, Brazil, Colombia, India, Mexico, and Nigeria focus upon specific factors and processes which either have accounted for recent increases in agricultural productivity in some countries or have caused agricultural stagnation in others. These countries were selected to be representative of both the more advanced and the less advanced countries in terms of agricultural production rates.

DRAFT 9/10/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Analysis of Factors Associated with Differences and Changes in Agricultural Production in Less Developed Countries.

2. Contractor: USDA/Economic Research Service, PASA No. RA-2-00.

   Principal Investigator: Wade F. Gregory, Economic Development Branch, Foreign Development and Trade Division, USDA/ERS.

3. a. Date of Signing PASA: March 20, 1963.

   b. Funding (Obligations):

FY 1963	$ 125,000
FY 1964	355,785
FY 1965	386,400
FY 1966	417,360
Total (to date)	$1,284,545
FY 1967	$ 390,000 (requested)
FY 1968	270,000 (estimated)

   c. The PASA has been amended each year to provide funding.

   d. Estimated completion date - June 30, 1969.

4. Project Monitors:

   Frank W. Parker - May 1963 to September 1965
   Douglas D. Caton and L.J. Gill - September 1965 to present.

5. Origin of the Project: The project was jointly developed by AID/W (HRSD/AGR) and USDA (Economic Research Service) after determining USAID interest and support (AIDTO CIRC A-98, 10/9/62).

II. Evaluative Information

6. Description of Project:

   a. The objectives of this project are to analyze existing data in 26 selected countries in order: (1) to determine differences among countries in rates of progress in improving agriculture; (2) to ascertain those factors most commonly associated with high rates of increase in output and productivity; (3) to provide AID with basic information indicating possible means of improving the

effectiveness of economic and technical assistance programs in furthering agricultural development of the less developed countries; and (4) to describe through case studies the processes by which less developed countries make the transition from low to higher levels of agricultural output and productivity.

(1) Phase A

This study was undertaken to measure levels and changes in agricultural output in the less-developed countries since 1946. This information was needed to provide a factual basis for formulating more sharply focused policy guidelines for agricultural development assistance programming. Establishing the levels and trends in agricultural output was one dimension of the data requirement. The probable sources and reasons for changes in productivity also needed to be identified and analyzed. Therefore, the study was divided into two phases. Phase A provided basic statistical data and, by an indexing process, related agricultural output to selected variables that could be measured and which were assumed to be explanatory of change in output.

The phase A portion of the study was based upon information mainly compiled from secondary sources. In addition to showing trends in agricultural output, phase A examined selected physical, social, and economic elements of the 26 nations that might explain differences in agricultural production and development patterns. The major findings of the first or comparative phase of this research project on differences and changes in agricultural production in underdeveloped countries were published as Foreign Agriculture Economic Report No. 27, "Changes in Agriculture in 26 Developing Nations," USDA, November 1965. The publication also contains an illustration of possible uses of the statistical analyses made in agricultural development planning.

Phase A was completed by a team of 11 researchers under the direction of a research leader, the leader being responsible for the work plan, coordinating the work, and preparing the final report, with the other members of the team being responsible for specific aspects of the study, each aspect being reported as a chapter in the publications on results. TCR/ARDS, an AID Advisory Committee, and an ERS Advisory Committee provided assistance in developing study plans, choosing study countries, determining information to be assembled, and suggesting analysis and form of presentation of findings.

The Economic Research Service gave the highest priority to collecting and analyzing available information and to developing methods of presenting the findings in a usable form. The close staff work between ERS and AID in programming the statistical studies and analyses to meet AID needs resulted in significant

achievements of Phase A exceeding the original objectives. For example: (a) Continuous feed-back to AID and other concerned agencies of the results of statistical investigations and factor analyses provided crucial information for task force studies and policy papers being prepared for the heads of both cooperating agencies. (b) New statistical methods and research designs were developed which have greatly improved the scope, accuracy and comparability of the USDA/ERS country-data collection and analysis operation. The benefit to AID of a continuing flow of statistical information on agricultural production in the LDCs, specifically designed for our needs will be considerable. (c) The Phase A report not only described and analyzed the performance of the agricultural sector, it also provided a methodology by which other countries can project their food needs in the future, measure current production performance, and identify the factors which will enable or inhibit the achievement of production goals.

(2) Phase B

Phase B studies in Taiwan, Greece, Brazil, Colombia, India, Mexico, and Nigeria focus upon specific factors and processes which either have accounted for recent increases in agricultural productivity in some countries or have caused agricultural stagnation in others. These countries were selected to be representative of both the more advanced and the less advanced countries in terms of agricultural production rates.

To account for differences in land and other natural features affecting production, the sample countries were arrayed by geographic cross-section. The attempt under the phase B portion is to determine the "organic" significance of the patterns and factor relationships in the agriculture of the less developed countries that were identified quantitatively in phase A as having prime significance with regard to incremental levels of change in output. Nine countries were originally selected for phase B, but the number has been reduced to seven (see above).

In the phase B studies undertaken so far methodological and data difficulties have been encountered. Constant attention must also be given the research to guard against the studies becoming discursive and to prevent them reaching out to encompass broader aspects of the social-political environment than the specific hypotheses directing the research. The common denominator for integration and generalization of the phase B studies is not statistical data, but is, rather, a comparative analysis made possible by common hypotheses. The extreme difficulty of this assignment emphasizes the requirement for experienced and perceptive research leadership.

Reviews of the first draft of the Taiwan phase B study and preliminary reports on the Mexico and Greece studies indicated

a need for clarification and redefinition of the objectives of phase B. At the request of the AID project monitor, the ERS investigators in Greece and Mexico were recalled for a work seminar in September, 1956, with the ERS project director and staff, the AID project monitor and staff, and the investigators who were scheduled to conduct studies in India, Brazil, and Nigeria. A new phase B Plan of Work was developed incorporating the mutually agreed upon basic data and information which would be required to meet AID objectives as well as those of the USDA. It was accepted that while each investigator should have a degree of flexibility in developing the research design and method, there was a basic minimum pattern that would have to be followed if the individual country studies were to be useful for inter-country comparative analyses.

The Taiwan study has been completed but in spite of a number of revisions of the draft report, an acceptable draft for publication has not yet been developed. Because of the importance of the Taiwan performance in agricultural development and the fact that the study does not adequately explain Taiwan agricultural development processes, additional descriptive and analytical work will be done, concentrating on the aspects in which the first study is particularly deficient, and determining the extent to which the Taiwan agricultural development process would provide useful policy and program guidance.

7. Contractor Performance

Phase A of the study was well formulated and well conducted. The difficulties enumerated for phase B relate to deficiencies in research design and work plans on a country basis, failure in the beginning to systematically relate the country studies to the ultimate goal of integration and overall analysis, and a number of the investigators lacked experience on this type of study.

Given that precise methodology did not exist, and needed to be formulated (a good portion of which depended upon the experience from the research), that recruitment of experienced personnel was difficult, and that research leadership could only be given on a periodic basis, the contractor has done as well as could be expected under the circumstances. ERS has made adjustments to improve the research, and is making every effort to do a creditable job. In this regard, workshops have been held, better work plans are being prepared, and technical advice on research design is sought. For justifiable reasons, one country study must be completely redone, as must portions of two others. Improved country studies will be one result in this instance; but a second and possibly more significant result of this experience is that we now have a better idea of how to formulate and conduct studies for agricultural sector planning.

8. Evaluation of Results

a. Major Results: Five semi-annual progress reports have been submitted by ERS covering activities in both phases A and B.

The findings of phase A of the AID/ERS study were published as "Changes in Agriculture in Twenty-Six Developing Nations, 1948 to 1963," Foreign Agriculture Economics Report No. 27, Economic Research Service - USDA, November 1965. Secretary Freeman announced the release of the report in an address at the Biennial Conference of the Food and Agriculture Organization, Rome, Italy, November 23, 1965. The press release stated that while the study confirms the serious nature of the world food crises, it uncovers a trend in some countries that indicates higher levels of food productivity can be achieved. The study reveals that no easy road exists to achieving higher agricultural production rates but it does indicate that freedom from hunger is possible.

The study shows that most of the 26 countries need larger increases in agricultural production to achieve their national objectives. In 17 of the 26 countries, increases in crop output were slower than the rate of increase in domestic food demands, caused by substantial increases in population and per capita income.

The following economic papers are also products of this research project:

The Mechanics of Agricultural Production and Economic Growth
The Role of Agricultural Production in Economic Development
Foundations for Agrarian Development
The Expanding World Fertilizer Market
How the U.S. Improved its Agriculture
Agricultural Economics and Technical Aid in Foreign Development

b. Known Uses of Results: The 26 Country Report was sent to all USAIDs and comments on its usefulness invited. Most USAIDs replying to the questionnaire indicated that the Report provided a useful method for measuring the performance of the agricultural sector in their host countries and for projecting agricultural development requirements. A number of USAIDs not included in the 26 country study stated that similar studies would be initiated in their countries and the results forwarded to USDA/ERS.

The basic data and information collected, tabulated and analyzed for the Phase A Report have been widely utilized in speeches and papers, including several by AID Administrator Bell and Secretary Freeman and 8 major papers by other AID and USDA officials. These data were also used in the preparation of the AID/USDA/BOB Task Force Report on World Food Problems.

A seminar on Agricultural Development, sponsored jointly by AID/USDA and JCRR under this project, was held in Taiwan to study the economic development of agriculture in Taiwan described in a condensed version of the ERS Taiwan Report and JCRR report "Agricultural Development and its Contribution to Economic Growth in Taiwan." The seminar was attended by country and AID representatives from Korea, Thailand, Philippines, Vietnam, Turkey and The Republic of Free China. There were also AID representatives from India, Afghanistan and AID/W. ECAFE and the Agricultural Development Council sent observers.

A draft of the phase B study in Greece was received by TCR/ARDS in early August but has not yet been evaluated.

c. Professional Evaluation of Results: The phase A study can stand on its own by reason of the experience gained, the determinations made on improvements in data-gathering and analysis procedure, the disclosure of needed kinds of supplementary and supporting research, i.e., demand and price analysis and country agricultural sector planning, the potential guidance provided for the phase B country studies, and the statistical and background data provided for policy papers and technical assistance programming. The report of findings on the 26 country analysis is a completely professional and useful document.

The weaknesses of the phase B portion of the study are that the research procedure for the individual country studies was not directly and specifically derived from the major questions regarding the instruments and sources of change laid out by the 26 country study. Partly this was due to overlap of the completion of phase A and the beginning of phase B. As a result, a consensus on the hypotheses to be tested, based on the findings of phase A, was not available for the guidance of the Taiwan, Mexico and Greece studies. While an attempt has been made to formulate a common methodology (see above), this has proved difficult. A further difficulty rests upon the heterogenity of makeup among the countries, and the lack of uniformity, reliability, and completeness of the common data required. Accordingly, while an attempt will be made to bring the studies together in an integrated fashion for generalization, as the phase B studies now stand, they should be looked upon as individual country studies, with integration and possible generalized findings being a hoped-for but somewhat problematic possibility.

9. Plans for the Future

The number of individual country studies will be held at seven pending determination of the study integration possibilities, refining of methodology, and determination of research direction, i.e., doing more complete and comprehensive country studies,

appropriately disaggregative in nature, with integration of findings an appropriate methodological question.

A basic question of this research is the extent to which procedure used in one country would be found helpful in other countries. Seldom is it found that the form can be transferred but it is highly likely that principles and functions can be transferred. Taiwan, for example, did not destroy the existing institutions; it appropriately reconstructed, changed, and in many cases, reoriented them. Consequently, they didn't lose time, effort, or sequence.

Thus other countries might receive guidance from what was done in Taiwan; how the development and use of institutions, simple in form but integrated in concept, created the basic matrix for organizing and motivating farmers, extending science and technology, providing roads and markets, encouraging leadership, and establishing methods of comparing alternatives for sound economic decisions.

The failure of the first research effort to capture the essence and the sense of this undertaking is why the Taiwan study is being done over. The remaining studies will likewise be examined on this basis -- what has been found useful that can be applied here, and what have they not done (including the country being studied) that should be changed from the point of policy, incentives, knowledge, inputs, markets, and institutions.

This demand on this study may be more than proves possible but we are looking to the long-run requirement for information and to long-run policy guidance from research. We know that we cannot depend upon or demand that individual projects supply all the answers but believe that this project can contribute a great deal to our knowledge of how agriculture develops.

Signed: _____
Monitor

Approved: _____
Director, TCR/ARDS

LJGill/DDCaton:TCR/ARDS:9/10/66

DRAFT

Research Program

Date: September 13, 1966
Current Monitor: Dr. Douglas D. Caton
Mr. Martin Stoller
TCR/ARDS and IA/ID

PROGRESS REPORT

Project Title: A Comparative Study of Food Marketing Systems in Latin American Countries in Early Stages of Economic Development

Contractor (or U.S. Agency): Michigan State University

Origin : Solicited [ ] Unsolicited [x]

Status : Active [x] Completed [ ]

Duration: Date of initiation April 15, 1965

Date of completion (Actual or estimated) October 14, 1967

Cost : Total (Actual or estimated) $395,162 (30 months, fully funded)

Obligations (through 6/30/66) $395,162

Project Summary

Objective: To make a comparison of food marketing systems in L.A. countries with the broad purpose of developing information needed to design more efficient, lower cost food processing, marketing, and distribution systems.

Description: Phase I will evaluate results of the 1950 study of food marketing conducted in Puerto Rico by Harvard University and the University of Puerto Rico; conduct additional marketing surveys; and hold a symposium on food marketing in San Juan. In Phase II, research similar to that in Puerto Rico will be conducted in Argentina or Brazil (probably Brazil).

Work in Puerto Rico is proceeding on schedule under good working arrangements; and a report of the Puerto Rican study and the seminar will soon be submitted to A.I.D. for review. Recommendations for changes in the marketing system in Puerto Rico have been given to the government.

UNCLASSIFIED

Draft
9/12/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: A Comparative Study of Food Marketing Systems in Latin American Countries in Early Stages of Economic Development.

2. a. Contractor: Michigan State University, Contract No. AID/csd-786.

   b. Principal Investigators: Dr. Charles C. Slater and Dr. Harold M. Riley, Agricultural Economists, and Dr. Vincent Farace, College of Communications, (Replacement for Dr. John T. McNelly, Professor of Journalism

3. a. Date of Signing Contract: April 15, 1965.

   b. Funding: $395,162 (30 months, fully funded).

4. Project Monitors:

   Herbert D. Turner, April 15, 1965 to February 10, 1966
   Douglas D. Caton and Martin Stoller, LA/ID,
   February 10, 1966 to present.

5. Contract Origin:

   Unsolicited.

II. Evaluative Information

6. Description of Project:

   a. The objective of this study is to make a comparison of food marketing systems in Latin American countries

with the broad purpose of developing information needed to design more efficient, lower cost food processing, marketing, and distribution systems.

The research will establish an adequate analytical basis for the design of efficient food marketing and distribution systems for countries with limited experience and know-how in developing this type of economic institution.

In Phase I, a study of the San Juan, Puerto Rico food market area, the contractor will evaluate results of the 1950 study of food marketing conducted in Puerto Rico by Harvard University and the University of Puerto Rico; document the overall pattern of economic growth in Puerto Rico from secondary data; describe the history of the food marketing program; conduct surveys of consumers, retailers, wholesalers, processors, and assemblers to provide data for gauging the extent and nature of changes in food marketing since 1950; study the communication networks for information concerning prices and supplies at each step along the assembly and distribution channels serving the food markets; and conduct a symposium on food marketing in San Juan.

In Phase II, research similar to that in Puerto Rico will be conducted in Argentina or Brazil.

b. The contractor had two MSU graduate students working full time in the San Juan study. The principal investigators, an agricultural economist and a communication specialist, spent part time on the study, and a Puerto Rican marketing specialist was assigned full time. The data collected have been put on IBM cards and have been processed by computer. A seminar which included Michigan State University, the University of Puerto Rico,

the advisory committee, eight Latin American countries, FAO and AID/W was held in June 1966 to consider the preliminary findings.

7. Contract Performance:

No serious difficulties were encountered in conducting the research in San Juan. The contractor and the University of Puerto Rico have both put some of their top market economists on this project and the work is proceeding on schedule. The workshop organized by the contractor was attended by over 100 individuals with an average attendance of over 70 at each session. The advisory committee has provided considerable guidance for the research and it has also been tied in with the research activity of Latin American Market Development Planning Center (also at M.S.U.), FAO in Colombia and with other market problem research being done in several South and Central American countries. The relation of this research to other market research being conducted on various aspects of marketing in Latin America is found in the design of this project to develop useful generalizations for assessing and handling different problems over the length and breadth of market development.

8. Evaluation of Results:

a. Major Results

The contractor is presumably completing a technical report on the San Juan workshop. During this workshop, research results, based in part on 861 questionnaires obtained from participants in the market were presented and discussed. Improvement in analysis procedures were suggested and these will be taken into account in the final analysis.

As a result of this seminar and the preceding research; (1) a set of recommendations have been given to the Government of Puerto Rico for agricultural marketing

improvement; (2) a set of recommendations were drawn up for "marketing institutions" reform in other Latin American countries; (3) a better understanding of the relationship between the food marketing process and total economic development has been gained; and (4) a way has been found to test the receptivity of local people to proposed market improvements.

In addition, an early economic model of the Puerto Rican economy has been reconstructed. This input-output model was developed origionally for the Planning Board. By disaggregating the demand components and restructuring the input-output matrix for the food industry, consumption functions have been derived from time series and cross-sectional data. The new analytical model will be useful in estimating the possible effects of changes in food marketing.

b. Professional Evaluation of Results

It is still too early to determine how far-reaching the effects of this research will be. However, the written progress reports and the oral reports on the June seminar are very encouraging. This research has provided the material for seven graduate theses -- two by Americans at Michigan State University and five by Puerto Ricans at the University of Puerto Rico and the College of Agriculture, Mayaguez. This indicates that this project has value, both by adding to the existing fund of knowledge and by building up the research competence of Puerto Rican institutions.

c. Known Uses of Results

The modified economic model and the recommendations for market reform mentioned in 8a., above, are being considered by the Department of Agriculture and the

Planning Board, Government of Puerto Rico and the information gained from Phase I of this research has been fed into the Latin America Market Planning Center where it is being used to help plan food marketing programs in Bolivia, Argentina and Brazil.

9. Plans for the Future:

The report of the Puerto Rican study and of the seminar will soon be submitted to A.I.D. for evaluation and review. It will then be published as "An Analysis of Changes in the Puerto Rican Food Marketing System, 1950 - 1965" (proposed table of contents attached - Appendix I) and distributed to appropriate Missions, countries and institutions.

Phase B of the study is about to get underway. A team is now in Brazil making arrangements for work in that country. It had been expected that work would start in Argentina about July 1, 1966 but this has been delayed indefinitely because of changing government structure.

Efforts will continue to be made to tie this research in with a similar project being conducted in Africa by Stanford Research Institute, with the work being done by the Latin American Marketing Planning Center, and with the food marketing work being done by FAO in Latin America.

Attachment:
Appendix I

Signed: _____
Monitor

Approved: _____
Director, TCR/ARDS

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Appendix I

AN ANALYSIS OF CHANGES IN THE PUERTO RICAN FOOD MARKETING SYSTEM, 1950-1965

DRAFT

Research Program

Date: September 12, 1966

Current Monitor: Dr. Douglas D. Caton
TCR/ARDS
~~xxxRSR~~

PROGRESS REPORT

Project Title: Farm Marketing Facilities and Practices in Tropical Africa

Contractor (or U.S. Agency): Stanford Research Institute

Origin : Solicited [ ] Unsolicited [x]

Status : Active [x] Completed [ ]

Duration: Date of initiation May 28, 1965

Date of completion (Actual or estimated) November 27, 1967

Cost : Total (Actual or estimated) $564,037 (FY 65 for 30 months)

Obligations (through 6/30/66) $564,037

Project Summary

Objective: To identify ways in which agricultural produce in Kenya, Nigeria and Sierra Leone can be marketed more effectively to increase agriculture's contribution to economic growth, including program guidelines, and technical assistance activities.

Description: Supply, demand, prices and market facilities are studied together. Necessary data will be obtained through interviews with farmers, truckers, processors, wholesalers, retailers, consumers, and market officials. Field work was initiated in March 1966. Reports have been received from the Advisory Committee and others that this study is well designed and conducted.

DRAFT 9/10/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Farm Marketing Facilities and Practices in Tropical Africa.

2. Contractor: Stanford Research Institute, Contract No. AID/csd-801.

   Principal Investigator: Dr. William O. Jones, Professor and Economist, Food Research Institute.

3. a. Date of Signing Contract: May 28, 1965.

   b. Funding: FY 1965 - $564,000 (for 30 months).

   c. Amendment: Dated December 23, 1965, provided for SRI to undertake the research responsibility originally assigned to the University of Wisconsin. Wisconsin withdrew because of staffing problems.

4. Project Monitors: Frank W. Parker - May 28, 1965, to December 1965.
   Douglas D. Caton - January 1966 to present.

5. Origin of Project:

   Dr. Jones is a marketing specialist and has conducted a number of surveys on aspects of marketing in Africa. His research proposal was based on a preceptive need for a study on the various aspects of marketing to provide an analytical basis for improving upon traditional marketing systems and to develop more adequate market facilities.

   This research is also related to, and supports, the nine AID-financed projects dealing with Nigerian rural development and will provide for cross-country comparisons with a similar market study being concurrently conducted in Latin America.

II. Evaluative Information

6. Description of Project:

   a. This research is designed (1) to identify ways in which agricultural produce in three representative African countries -- Kenya, Nigeria, and Sierra Leone -- can be marketed more effectively to increase agriculture's contribution to economic growth, and (2) to assist in the preparation of program guidelines and technical assistance activities to increase the

effectiveness of the marketing of staple food crops in Africa.

b. The research is being conducted in four areas of the three countries by sub-contractors and cooperating host-country institutions as follows:

Western Nigeria - SRI and University Ife
Eastern Nigeria - Michigan State University and University of Nigeria
Sierra Leone - University of Illinois and Njala College
Kenya - University of West Virginia and University of Kenya

One American agricultural economist and one African agricultural economist comprise the research team in each area.

The basic assumption of the study is that supply, demand, prices, or market facilities cannot be studied separately. They must all be studied together if anything conclusive is to be determined about how prices are established, how market facilities should be set up and operated, and how production, its characteristics and fluctuations, relate to the kinds of market and processing facilities needed, or which can be supported, and how demand and price relate to production quality and volume flows. These central aspects of a "market" in turn regulate, and at the same time are regulated by, conditions necessary for effective functions and operations, such as licenses, taxes, storage, credit, transportation, grades and quality control, communications, and skills in production and marketing. Then, given the scheme, organization, and interdependent "flows" of products and information, as an effective design of market operations, the entire process must be given physical and institutional form and policy support.

The necessary data on which to base recommendations and conclusions on improved market systems will be obtained through interviews with farmers, truckers, processors, wholesalers, retailers, consumers, and market officials. The investigators will secure information on all aspects of the marketing process relating to staple food crops; e.g., supply, demand, prices, grades or standards, transportation, credit, taxes, licenses, processing, storage, volume of business, costs of operation, and returns.

7. Contractor Performance:

The research is well designed and a detailed work plan for general and specific guidance of the research was prepared during a training workshop held under Dr. Jones' direction in Palo Alto in May 1966. A technical report on the workshop has been prepared.

The questionnaires and other field research techniques have been pretested in the field and found to be satisfactory. The Advisory Committee for this project has met regularly and, at Dr. Jones' request, the Advisory Committee has gone to Africa to consult and advise on field research procedure. Reports have been received from both the advisory team and from others interested in the study that this is an excellently conceived and conducted study.

8. Evaluation of Results:

Dr. Jones is a well recognized agricultural economist and the research team has considerable professional stature. The Advisory Committee is composed of name research personnel. The research procedures being followed and the guidance being given this research by its leadership and by its Advisory Committee forecast useful results for AID and the host countries.

9. Plans for the Future:

Field research was initiated in March 1966, and will be concluded about the same time in 1967. Closer coordination will be developed with CSNRD in Nigeria, and with the Latin America marketing study on methodology and procedure and, in the case of CSNRD, on an interchange of data on marketing.

Plans for analysis and reporting are now being developed.

Signed: _____
Monitor

Approved: _____
Director, TCR/ARDS

R.T.McMillan/D.D.Caton:TCR/ARDS:9/10/66

DRAFT

Research Program

Date: September 12, 1966

Current Monitor: Dr. Robert T. McMillan
TCR/ARDS
~~SOC/RSR~~

PROGRESS REPORT

Project Title: Diffusion of Innovations in Rural Societies

Contractor (or U.S. Agency): Michigan State University - Contract No. AID/csd-735

Origin : Solicited [ ] Unsolicited [x]

Status : Active [x] Completed [ ]

Duration: Date of initiation December 10, 1964

Date of completion (Actual or estimated) December 9, 1968

Cost : Total (Actual or estimated) $1,236,000 (includes equiv. of $36,000 in Rs)

Obligations (through 6/30/66) $ 950,000

Project Summary

Objective: To determine information on the understanding of benefits from using improved agricultural production practices and to develop effective means of communicating useful information on new technology to farmers.

Description: The studies are being conducted in Brazil, India, and Nigeria. Each country project embodies three phases. The basic unit of study in Phase I was the agricultural village; in Phase II the relationship between farmers background, skill, farm size, etc. to acceptance of new technology; and in Phase III, situations will be selected where experimentally-designed incentives for adoption of farm practices may be carried out with different communication channels or techniques to test their effectiveness.

A communications manual, prepared by the project staff, has been approved by the Government of Brazil and is being printed by the USAID Mission for use by Brazilian agricultural technicians. As a whole, however, present progress is not such as to permit evaluation of the project as a whole.

DRAFT 9/10/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Diffusion of Innovation in Rural Societies

2. Contractor: Michigan State University - Contract No. AID/csd-735

   Principal Investigator: Everett Rogers, Department of Communications, Michigan State University

3. a. Date of Signing Contract: December 10, 1964 (4 years)

   b. Funding:

FY 1965	-	$500,000
FY 1966	-	450,000
FY 1967	-	286,000 (to completion)
		$1,236,000

   c. Two contract clarification amendments have been made.

4. Project Monitors:

   Dr. W. A. Lybrand - December 10, 1964 to August 1965
   Dr. Robert T. McMillan - August 1965 to present

5. Origin of Project: Dr. Rogers submitted this research proposal in late 1963, suggestions were incorporated, and the research was contracted on the basis of the revised proposal.

II. Evaluative Information

6. Description of Project

   a. The purpose of this research is to obtain a better understanding of how the process of adoption of innovations occurs in agriculture, and the main factors and inter-relationships which hinder further adoption of improved technology. To more effectively assist countries to achieve more food output from the agricultural sector, better information is needed about farmer inclination to adopt new practices and how general diffusion and acceptance of improved production practices occurs in traditional rural societies.

   Specific objectives of the project are: (1) to determine the relation of knowledge about the benefits from using improved agricultural production practices and availability of technical inputs and services to improvement in agricultural output; and (2) to determine effective means of communicating and/or educating farmers on the use and benefits of advanced technology.

b. The research is being conducted in Brazil, Nigeria and India in a three-phase sequence as follows:

Phase I: Determination of how information is received and spread, and its relative impact, evaluating different media and forms of information and the determination of the role of village and farm leaders in the diffusion process.

The basic unit of study in Phase I of the present investigation is the agricultural village. In addition to general data on village characteristics, information will be gathered on:

(1) Experiences of the villages with programs to increase agricultural production through selected practices like improved seeds and fertilizer. Analyses may be made of the recent introduction of farm practices, and the success or failure of programs of change in these villages.

(2) The role of social organization, social class, caste, leadership patterns, kinship groups, local power structure, local political groupings, village factionalism, formal organizations, economic factors, the initiative of local formal and informal leadership, and village values and attitudes in blocking or facilitating programs of social change.

(3) The patterns of village decision-making, the channels through which sanctions and approvals are given in the village, and the role of formal and informal leaders.

(4) The influence of factors external to the village such as availability of seed, fertilizer, implements, credit, and markets, marketing practices, land tenure, irrigation, and other agricultural, political, or economic policies, on the relative success of programs of change.

(5) The relationships of the village to other villages, districts, areas, regional and national units of the society, and the effect of these relationships on local programs of change.

These data from the village analysis would be made available relatively early in the process of the present investigation, and would provide (a) suggestions for conducting the second stage of the present investigation in which the farm families in a smaller number of selected villages in each country are interviewed, and (b) early results for the future guidance of A.I.D. and other programs of change.

Phase II: Using farm interview data, a determination will be made of the relationship between farmers background, skill, farm size, and the like and their motivation to accept new technology. Various hypotheses and valid tests are being used to indicate excellence in farming and to measure motivation and incentives for the adoption of agricultural innovations.

Phase III: After initial research experience has been gained in Phases I and II, situations will be selected where experimentally-designed incentives for adoption of farm practices may be carried out with different communication channels or techniques. Comparisons will be made between "control" and "treatment" villages in an attempt to identify the relative effectiveness of selected incentives to accelerate the adoption of practices.

7. Contractor Performance

The project staff are well versed in this type of research. Data analyses have been made of the portions of Phase I and II that are completed. Preliminary reports have been prepared presenting tabular materials, preliminary conclusions, and cross-country comparisons.

It is expected that Phases I and II will be completed in Brazil, Nigeria and India by January 1967. Phase III is still tentative, initiation will depend upon finding the idealized situation as specified above, and upon guidance provided by the findings under Phase I and II.

8. Evaluation of Results

a. Major Results

Michigan State University has developed a central library facility at East Lansing to assemble publications on diffusion of innovations. A bibliography is published annually. The Center has accumulated about 1,000 publications, one-third of which represent research done outside the United States.

A series of research reports on "diffusion" are anticipated and the project staff in Brazil has prepared, at the request of the Government of Brazil, a manual on communications for use by agricultural extension workers.

From the field work under Phase I in Brazil, it can be reported that:

(1) Rural community organization is poorly developed; local leaders look to central government for guidance in agriculture, and have no interest in organizing farmers for group activities directed toward local improvements.

(2) There is little evidence of community spirit or cohesion. If they could improve their income elsewhere, most farmers would leave agriculture. Most rural youth prefer occupations outside agriculture. Rural people lack an awareness of their community's specific problems and little interest in problem-solving.

(3) Two groups of community leaders are identified: one linked to the municipio center through ties of politics and money interests, the other centered in the local community with kinship ties. Neither group is concerned with modernizing agriculture or experimenting with improved farming practices.

(4) The level of communication among villagers, and between villages and outsiders, is extremely limited. A few men meet at stores and coffee shops; politics are often discussed but farming rarely.

b. Professional Evaluation of Results

The progress reports show that considerable time and effort have been spent in training the project staff and planning the operations. The Diffusion Documents Center promises to be a valuable addition to project results.

c. Known Uses of Results

A communications manual prepared by the project staff has been approved by the Government of Brazil and is being printed by the USAID Mission for use by Brazilian agricultural technicians.

9. Plans for the Future

The low level of communication found in Brazil seems to be common in rural areas of the LDCs. As the project discovers practical ways and means for improving communication on innovations, they will be reported to missions and cooperating countries.

Future plans include:

a. Knowledge Useful to Encourage Innovations

(1) Identifying agricultural innovators and opinion leaders, and determining their distinctive social and economic characteristics, communication behavior, attitudes and values, so that change agents can more effectively introduce innovations in villages and communities through them.

(2) Identifying the role and influence of various communication channels and techniques such as mass media, opinion leaders, personal contacts, and demonstration projects in the farm-practice adoption process.

(3) Introducing various communication and economic incentives (such as credit) through various communication channels, and determining the response to these incentives.

(4) Identifying the influence of presently existing price incentives, credit, land tenure, marketing practices, and other economic factors on the adoption of new agricultural ideas.

b. Methods Useful to Further Research

(5) Developing improved research methods for study of the diffusion and adoption of farm innovations in traditional societies, so that these methods of investigation may be utilized in future studies.

c. Strengthening Personnel and Host-Country Institutions

(6) Training both U. S. and non-U. S. social researchers in methods of study design, data-gathering, and analysis for future investigation of the diffusion and adoption of farm innovations in developing societies.

(7) Building an institutional structure for diffusion-adoption research and action programs in the participating countries so that self-stimulated research and action programs will continue after this research effort has been completed.

It may be desirable to continue the project after 1968 with a revised scope of work which would include research on problems encountered under this project.

Signed R. T. McMillan
Monitor.

Approved Douglas Tinstay
Director, TCR/ARDS

RTMcMillan/JRWilson/DDCaton:TCR/ARDS:9/10/66

DRAFT

Research Program

Date: 9/12/66

Current Monitor: Mr. Robert T. McMillan
TCR/ARDS
~~-or- PC/-~~

PROGRESS REPORT

Project Title: Analysis of Data on Development-Related Attitudes and Behavior of a National Sample of the Turkish Peasantry

Contractor (or U.S. Agency): Center for International Studies, Massachusetts Institute of Technology

Origin : Solicited [x] Unsolicited [ ]

Status : Active [x] Completed [ ]

Duration: Date of initiation June 1, 1965 for 1 year

Date of completion (Actual or estimated) Extended from June 1966 to October 1, 1966

Cost : Total (Actual or estimated) $33,340

Obligations (through 6/30/66) $8,500 (The balance has been withheld pending completion of the report.)

Project Summary

Objective: To establish a practical way of obtaining valid country-wide information on attitudes and behavior of peasants for policy and planning purposes in a LDC.

Description: For the objective sought, a national sample survey of 8,000 peasants in 460 villages was made in Turkey. The data were tabulated. Thirteen reports were to be prepared, of which 2 have been received. It does not appear likely that Dr. Frey will be able to meet the October 1 deadline.

It is difficult to assess the results of this project. The two reports submitted are long and lack summaries of findings useful to A.I.D. and GOT. The recommendations of the first report were deleted at the request of the GOT. The Reports are directed more to the American academic community than to government administrators and policy makers.

DRAFT 9/10/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Analysis of Data on Development-Related Attitudes and Behavior of a National Sample of the Turkish Peasantry

2. Contractor: Center for International Studies
Massachusetts Institute of Technology

Principal Investigator: Dr. Frederick W. Frey
Department of Political Science

3. a. Date of Signing Contract: June 1, 1965

b. Funding: FY 1965 - $33,340 (one year)
Note: $8,500 has been committed to the contract. AID is holding the remainder pending completion of the work.

c. Amendments:

The contract was amended in June 1966, without additional funding, to provide for completion of the research reports.

4. Project Monitors:

Dr. Frank W. Parker - June 1, 1965 to December 1965
Dr. Robert T. McMillan - January 1, 1966 to present

5. Origin of the Project:

Dr. Frey had a personal services contract for a somewhat similar project with NESA from May 28, 1962, to May 31, 1965. By agreement between TCR, NESA and Dr. Frey, this contract replaced the personal services contract funded by the NESA region and specified a revised and expanded scope of work. The obligations in the personal services contract on reports to be prepared were included in the research contract.

II. Evaluative Information

6. Description of the Project

a. The objective of this research is to establish a practical way of obtaining valid country-wide information on attitudes and behavior of peasants for policy and planning purposes in a less developed country.

b. For this purpose, a national sample survey of 8,000 peasants in 460 villages was made in Turkey in 1962. The methods of analysis of the data include cross-tabulation, simultaneous control of several variables, factor analysis and multiple regression.

The investigator has agreed to prepare 13 reports on the following topics: mass media, education, literacy, acceptance of innovations, land tenure, political orientations, religion, youth, social structure, village development, male and female roles, values and expectations, and a final summary report.

7. Contractor Performance

For various reasons, Dr. Frey has not been able to complete the research and analysis according to the original schedule. The first two reports on the study, due October 1, 1965, were not received until March and April, 1966. The remaining reports due have not been received and it does not appear likely that Dr. Frey will be able to meet the October 1 deadline specified in the contract extension.

Also, the Government of Turkey reviews each report before publication. The Government of Turkey requested numerous deletions and revisions of statements and materials contained in the first two reports and probably will do so for the remainder.

The mass of data to be sorted and classified requires a great deal of time and effort, involving the use of a computer. Computer time must be scheduled with regard to other demands. In additional to supervising the data compilations, Dr. Frey also prepares the draft of each report. He also has a teaching responsibility at M.I.T.

8. Evaluation of Results

Monitor's Evaluation of Results

It is difficult to assess the results of this research. The two reports submitted are long and lack summaries of findings useful to A.I.D. and the GOT. The recommendations contained in the first report were deleted at the request of the GOT. The reports, as originally submitted, seem to be written primarily for reading by the American academic community rather than to assist in decision-making by government administrators.

The GOT has asked that the project be completed soon. This is because the State Planning Organization in Turkey, which financed most of the Rural Development Research Survey, is preparing a new national development plan and wants to use the information on which the study is based.

Information has been received that Dr. Frey has entered into a large contract, utilizing Department of Defense funds, to conduct worldwide research similar to the Turkey Study and is developing this additional research concurrent with finishing the Turkey reports.

All of these things argue against early completion of results and presentation of findings. In this regard, discussions have been held with M.I.T. and Dr. Frey on these matters, and Dr. Frey is aware of GOT and A.I.D. concern about the study reports.

9. Plans for the Future

Time for completion of the contract was extended from June 1966 to October 1, 1966 in agreement with M.I.T. The contract has an unexpended balance of approximately $25,000. The contractor consistently has underestimated the amount of work on this commitment and has failed, apparently, to balance out other obligations and commitments against the time requirement for this contract. There is no reason to believe that he will be able to meet the October 1 deadline, leaving only two possibilities open: 1) to declare the contract in default, or 2) to extend the contract again.

Signed R. T. McMillan
Monitor

Approved
Director, TCR/ARDS

RTMcMillan/JRWilson/DDCaton:TCR/ARDS:9/10/66

DRAFT

Research Program

Date: September 12, 1966

Current Monitor: Dr. Douglas D. Caton
TCR/ ARDS
or PC/

PROGRESS REPORT

Project Title: **Program of Research and Training in Land Tenure and Reform in Latin America**

Contractor (or U.S. Agency): **University of Wisconsin**

Origin : Solicited [X] Unsolicited [ ]

Status : Active [X] Completed [ ]

Duration: Date of initiation **May 11, 1962**

Date of completion (Actual or estimated) **June 30, 1968 (Extension for an additional year is contemplated under current contract.)**

Cost : Total (Actual or estimated) **$3,463,275**

(Support by other donors has amounted to approximately $200,000 per year)

Obligations (through 6/30/66) **$2,963,275**

Project Summary

Objective: **To carry on research, training and service activities in land tenure in countries of Latin America through a Land Tenure Center at Madison, Wisconsin, and to conduct field research in cooperation with professionals at local universities, research institutes and government agencies.**

Description: **The research deals with land tenure problems and situations (including agrarian reforms) in relation to economic development and operational policies; training of graduate students of the U. S. and countries of Latin America; and service activities, including building up and dissemination of a volume of information on land tenure problems.**

Field work is presently underway in seven countries. The Center has issued about 70 publications. By mail or direct personal request, the Center handles more than 200 requests for information each week. The Center's library has a substantial collection of material on agrarian reform and economic development in LDCs.

The project has yielded useful and encouraging results. A summary of research findings to date, of services rendered, and problem considerations will be available within a month.

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DRAFT 9/9/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Program of Research and Training in Land Tenure and Reform in Latin America

2. Contractor: University of Wisconsin

   Principal Investigator: Dr. Peter Dorner, Department of Agricultural Economics

3. a. Date of Initiation: May 11, 1962

   b. Funding:

FY 1962 -	$1,393,275 (three years)
FY 1965 -	570,000
FY 1965 -	500,000
FY 1966 -	500,000
Total (to date)	$2,963,275
FY 1967	$ 500,000
FY 1968	$ 500,000

   c. Amendments: No. 1, dated September 25, 1962, further specified the objectives of the project; No. 2, dated September 17, 1963, detailed the conditions and terms for training of local researchers; No. 3, dated December 29, 1964, extended the contract through June 30, 1966, and formally continued support of this program through June 30, 1969, at an estimated annual budget of $500,000, subject to availability of funds and subject to AID's review and approval of the Contractor's annual continuation proposal; No. 4, dated June 25, 1965, extended the contract through June 30, 1967; and No. 5, dated May 31, 1966, extended the contract to June 30, 1968.

d. Other Financial Contributions: In addition to the funds provided by AID, financial contributions are made to the Land Tenure Center by other donors amounting to approximately $200,000 per year. The University of Wisconsin, Latin American governments, foundations and international agencies contribute in varying amounts and for various purposes.

Contributions have come from such specific sources as: the University of Wisconsin, Ibero-American Program (Ford Foundation), Social Science Research Council grants, the Midwest University Consortium (Ford Foundation), various fellowships, the National Defense Education Act, the Agricultural Development Council (Rockefeller Foundation), the Rockefeller Foundation, and graduate school funds; and they have been used for such purposes as: salary support, special language instruction of LTC personnel, library materials, reproduction services and travel.

4. Project Monitors:

Responsibility for monitoring since inception:

REPAS/TCR/ORA	Mr. Jack C. Oppenheimer - to January 1965 Dr. William A. Lybrand - January to June 1965 Mr. Ernst Linde - June 1965 to March 1966
TCR/ARDS	Dr. Douglas D. Caton - March 1966 to present.

5. Origin of the Project:

Unsolicited proposal.

II. Evaluative Information

6. Description of Project:

a. The Land Tenure Center directs a program of research, training, and service activities. The project provides:

(1) Research in land tenure and reform in countries of Latin America. Specifically it deals with agricultural production as affected by type of land tenure and size of farm units; with existing agrarian reform legislation; with economic, social, and legal problems in the holding and using of land; and with land policies and remedial measures to

improve relationships between people in the use of land and in meeting growing demands for increased food production.

(2) Training of graduate students of the U. S. and of countries of Latin America and creating professional competence for dealing with issues of agrarian reform.

(3) Service activities which include building up and disseminating a volume of information in land tenure problems and agrarian reform in Latin American countries.

b. (1) The project operates through the Land Tenure Center at Madison, Wisconsin. The Center is the planning, coordinating, and service facility for carrying out this program.

(2) Field work is presently underway in seven countries: Bolivia, Brazil, Chile, Colombia, Guatemala, Nicaragua, and Venezuela. The most continuous and comprehensive research efforts have been in Chile and Colombia. Field centers, similar to the Madison Center, have been established in Chile, Colombia, and Bolivia. Field research is conducted in cooperation with professionals at local universities, research institutes, or government agencies. The Land Tenure Center cooperates with international agencies, especially with the Interamerican Institute of Agricultural Science (IICA), the Interamerican Committee of Agricultural Development (CIDA), and the Food and Agricultural Organization of the United Nations (FAO). The Center also cooperated closely with CIDA (Interamerican Committee for Agricultural Development) on four of its seven country studies of land tenure conditions and socio-economic development of the agricultural sectors of Latin American countries.

(3) A research Program Advisory Committee consisting of the Program Director, senior investigators, and other scientists and scholars, including some from other universities, advise the Center on overall program planning as well as on specific projects.

7. Contractor's Performance:

The individual country studies under the Wisconsin contract have been generally very good and valuable to the individual countries involved. And the training of researchers, both Latin American and U. S. has been of the highest standard. To meet the need for an integrated body of principles and

generalizations for use in a broad policy context, Dr. Darner prepared a paper in August 1965 setting forth methodological issues associated with integrating the individual country studies, a paper on which he has since elaborated upon in an extensive paper on an interpretive synthesis and policy implications of Land Tenure Center and related research.

In addition a statement on the need to pull the individual studies into a single integrated body of research for the purpose of generalization has been jointly prepared by LTC and TCR/ARDS, establishing a basis for additional progress in relating and integrating the individual studies.

8. Evaluation of Results

a. Major Results:

The Center has issued about 70 publications organized into six series, several motion pictures, photo exhibits, and a quarterly newsletter.

Approximately 17,000 copies of publications were distributed in 1965. By mail or direct personal request the Center handles more than 200 requests for information each week.

The Center's library has a large collection of material dealing with agrarian reform and social and economic development in Latin America. The Library adds approximately 500 books to its collection each year; subscriptions to over 100 periodicals; and has a substantial collection of audio-visual materials. During 1967, a system will be completed whereby all reference card information will be on IBM cards and tapes.

The Center at Madison has become a major focal point for people interested in land tenure and agricultural development problems in Latin America. In 1965 alone, close to 100 groups of one or more persons visited the Center to gather information for Latin American work. A major effort of the Center has been training new professionals through the participation of U. S. and Latin American students in research studies.

It is the trained professionals from the countries in Latin America that must develop the competence to formulate and guide government policies in land tenure and in economic development. It is the training of U. S. students that gives expansion to U. S. understanding of agrarian reform problems and needs in Latin America.

It is estimated that about 200 students have been associated with the Center for various periods of time, and, at least 30 Latin American students have had extensive field research experience including design of projects, data gathering, analysis and report writing. Many of these participants now hold posts with government agencies, with Latin American universities and with AID Missions. Also U. S. students trained are serving in U. S. universities and government agencies.

b. Professional Evaluation of Results:

As noted below, many of the individual country research efforts have been very useful to the host countries and to the missions in providing guidance in solving both immediate and long range problems and developing land tenure policy. The work generally has been competently done and the reports have been addressed to the problem at hand. However, this concentration on individual country problems has precluded the development of cross-country comparisons and the formulation of generalizations regarding land policy.

Dr. Dorner has just prepared a summary of the findings since the inception of the project (now under review in TCR/ARDS) which will be used as the basis for designing future research projects to attempt to correct this deficiency.

With this change in direction, it will be possible to design projects which will be useful for solving country problems and, at the same time, they will help develop the broad principles needed to formulate improved and more broadly applicable land utilization goals and policy.

c. Known Uses of Results:

The research studies have already yielded useful and encouraging results, which are being used in the countries of Latin America.

For example, in:

Bolivia

A combined LTC-CIDA study of the present land tenure structure in the northern altiplane of Bolivia has pinpointed the importance of land titles to land use and economic development. USAID is considering a new rural development project which will have as its objectives the completion of the process of land title distribution. (Ref. TOAID A-652, March 11, 1966)

Brazil

LTC personnel are given credit for helping to implement the recently published CIDA study of Land Tenure Conditions and Socio-Economic Development of the Agricultural Sector and analyzing the results (p. XIX of report, published by the Pan American Union, 1966).

Chile

USAID/Santiago reported a variety of uses of LTC findings and personnel (ref. TOAID A-1100, May 27, 1966) including the following:

- The proposed Agrarian Reform Law utilized LTC studies on profit sharing plans and irrigation water rights.

- Proposed government controls aimed at keeping private land subdivision practices in line with goals of public land reform measures are based on an LTC preliminary report on private subdivisions of large farms.

- An information system started by the National Agricultural Research Institute is similar to and can be traced to one tested by an LTC study of diffusion of technical information related to agrarian reform.

- An LTC study of the Institute of Agrarian Development (INPROA) served as basis for evaluating proposed USAID assistance to that organization.

Colombia

- Findings of an LTC study were helpful in evaluating the $10,000,000 USAID Supervised Credit Loan (ref. TOAID A-1017, April 15, 1966).

Venezuela

- USAID/Caracas reported that an LTC study on the "Federacion Campasina Venezelana" and its role in the Land Reform Program was "well done and useful" (ref. TOAID A-417, March 3, 1966).

And the continuous contact and communication between research personnel in the field and host country and U. S. AID officials has been fruitful, as the drafting of new legislation dealing with water rights in Colombia and the study-appraisal of agrarian legislation in several of the countries of Latin America will attest.

9. Plans

In addition to continued student training activity, and responding to mission and country requests for short-term advisory and evaluative assistance, the land tenure research in FY 1967 will focus on the following activities: land tenure reform experience in Bolivia; social factors related to migration and adaptation in new settlement areas in Brazil; the socio-economic impact of spontaneous land settlement in Nicaragua; the effect of seasonal migration on employment and on land settlement patterns in Guatemala; land tenure and farm size and taxation in Chile; service facilities such as sources and uses of credit, and technical information on farms operating under tenure and organizational arrangements, in Colombia; and campesino federation and land tenure in Venezuela.

Signed: _____
Monitor

Approved: _____
Director, TCR/ARDS

RTMcMillan/DDCaton/JRWilson: TCR/ARDS

DRAFT

Research Program

Date: September 12, 1966

Current Monitor: Mr. Louis J. Gill
TCR/ ARDS
or-~~PD~~/

PROGRESS REPORT

Project Title: Analysis of Programs for the Development and Improvement of Agricultural Credit Institutions and Services

Contractor (or U.S. Agency): Ohio State University

Origin : Solicited [x] Unsolicited [ ]

Status : Active [x] Completed [ ]

Duration: Date of initiation June 25, 1964

Date of completion (Actual or estimated) October 24, 1967

Cost : Total (Actual or estimated) $636,821

Obligations (through 6/30/66) 636,821

Project Summary

Objective: The objective of this project is to develop a set of principles about the role of credit in agricultural development and to identify the kinds of institutional arrangements which will most likely meet the credit needs of farmers in the transition period from subsistence type farming to production for the market. A general model will be developed to provide guidelines for AID technical assistance programs.

Description: The first phase of the project was a review of available studies, reports and other publications on agricultural credit programs in LDCs to develop a general working hypothesis on the needs of peasant farmers for credit and the kinds of institutions which had been created or adapted to successfully provide for their needs. The second phase is intensive field research in four Latin American countries to study in depth (1) what the credit needs of agricultural producers are, from the point of view of the farmer, the institutions serving them, and from the general hypothesis of how agricultural development takes place, and (2) to what extent existing institutions were created or have evolved to meet any of these criteria and how and why they have or have not operated successfully. The third phase will be the development of a general model based on the research results which will provide guidelines for overseas technical assistance programs.

DRAFT
9/9/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Analysis of Programs for the Development and Improvement of Agricultural Credit Institutions and Services

2. Contractor: Ohio State University - Contract No. AID/csd-463

   Principal Investigator: Dr. Mervin G. Smith and Dr. Raymond A. Bailey, Department of Agricultural Economics and Rural Sociology

3. a. Contract signed: June 25, 1964

   b. Funding: FY 1964 -- $636,821 (fully funded for three years)

   c. Contract amended February 3, 1965 to revise the annual budgets. No change in total cost.

   d. Contract was amended March 24, 1966 to clarify the scope of work with respect to the case studies to be performed in Phase II of the project.

4. Project Monitor: Frank W. Parker to April 23, 1965
   Louis J. Gill April 23, 1965 to present

5. Origin of Project: Proposal was in response to fields of research needs set forth in AID publication "AID Research in Agriculture and Rural Development".

II. Evaluative Information

6. Description of Project

   a. A.I.D. and its predecessor agencies have been providing capital and technical assistance in the field of agricultural credit in the LDCs for many years.

   The purpose of this project is to review and analyze the experience which has been accumulated in carrying out many kinds of credit projects under a variety of conditions. The objective of this research is to define in analytical terms the role of credit in various stages of rural development and to ascertain the institutional forms which are most likely to function successfully under differing conditions.

The results of this analysis will be used to develop guidelines for technical and economic assistance projects for the establishment and operation of permanent and effective institutions and systems for providing agricultural credit in the developing countries.

The contract provides for research in three phases as follows:

1. Phase I: Summary and analysis of all available data, reports, and studies of agricultural credit in the less developed countries of the world.

2. Phase II: Case studies in three countries in Latin America. The studies will include investigations of the development of agricultural credit institutions and systems; investigation of technical and economic assistance programs of outside agencies, and testing of hypotheses set up in Phase I.

3. Phase III: Completion of data collection and analysis and formulation of conclusions and guidelines as indicated in objectives of the project.

b. The first phase of the project, conducted on the home campus of Ohio State University, was the collection, classification and review of data obtained from A.I.D. Missions, AID/W files and other U. S. Government and private institutions. A preliminary research framework was developed for utilizing the material and to set up hypotheses about the performance of agricultural credit projects under varying conditions. Research plans for Phase II, intensive country case studies, were organized and a comprehensive library and documentation center set up at Ohio State University.

On the basis of a questionnaire sent to the field, plus preliminary evaluation of the collected data, three countries in Latin America were selected for intensive Phase II case studies of credit institutions and technical assistance projects sponsored by A.I.D. and other external agencies. A Consultative Committee of well known U. S. Government and private banking and credit specialists was set up to advise on the selection of countries and to assist in developing appropriate research hypotheses.

The countries finally selected were Ecuador, Colombia and Brazil. Peru was later added as a fourth country. Research has been completed in Colombia and teams are now working in the other three. All case studies will probably be completed by October, 1966.

Phase III will consist of completing the analysis of Phase I and II data on the campus and formulating the final conclusions and guidelines and preparation of the final report. Phase I was completed the first year. Phase II and III, involving country analysis, will require two years. All work is to be completed by October, 1967.

7. Contractor's Performance

The findings from the review and analysis of the reports and studies collected in Phase I were not sufficiently conclusive for the development of a general hypothesis of the role of credit in agricultural development or the kinds of institutions best suited to LDC conditions. They did, however, provide sufficient information for formulating the Phase II studies and guidelines for the selection of countries where the studies were to be carried on.

While each country study includes both an institutional performance and farmer need component, countries were selected on the basis of opportunities to emphasize one or the other component. The studies in Ecuador and Brazil give greater emphasis to analysis of farmer's credit needs while those in Colombia and Peru are directed primarily to the performance of credit institutions. Some delays were encountered in initiating Phase II due to the necessity of changing sites for country studies. The Dominican Republic and Guatemala had been selected on the first reconnaisance survey but events in those countries required that alternate sites be selected. The contractor surmounted these difficulties and the project is basically being carried out as originally conceived and planned; it is expected that only a minor extension will be required to complete the contract schedule, at no additional cost to A.I.D.

The contractor has assigned competent research staff to this project and has provided adequate leadership, both in the field and on the home campus.

8. Evaluation of Results:

a. Major results

The contractor has reported regularly on the activities of the staff on campus and in the field. Progress reports and future research plans have been submitted as consistently as the situation permitted, considering the uncontrollable delays encountered in Phase II. The principal investigators have kept in close touch with the AID/W project monitors on both substantive and operational matters and have developed excellent working relationships with the

USAIDs and host country officials in each country where they are working.

In addition to required periodic reports, the contractor's staff members have prepared and published the following:

1. "Selected Abstracts of Ph.D. Dissertations in Agricultural Credit and Related Fields, 1955-1964", Agricultural Finance Center Research Publication 103, Ohio State University July, 1965.

2. "Bibliography of Agricultural Credit", Agricultural Finance Center Research Publication 104, Ohio State University July, 1965.

3. "A Review and Appraisal of Recommendations for Agricultural Credit Systems in Developing Countries", Agricultural Finance Center Publication 106, Ohio State University August, 1965.

4. "The Influence of Selected External Factors Upon the Institutional Structure and Policies of Agricultural Credit Institutions in Latin America", Agricultural Finance Center Research Publication 107, Ohio State University August, 1965.

5. "Observations on the Evaluation of Agricultural Credit in Jordan", Agricultural Finance Center Research Publication 108, Ohio State University August, 1965.

b. Professional Evaluation of Results

Although it is the end product which will determine the value of this research project to A.I.D. missions and others, the country case studies have already yielded useful and encouraging by-products. USAID/Bogota reports that both the Mission and the host country officials are "highly pleased with the fine performance" of the contractor's research team (TOAID A-1129, 5/23/66). Details of the team's accomplishments directly useful to the Mission were stated in the airgram. USAID/Rio de Janeiro reported (TOAID A-1869, 9/3/66) that "progress to date and results have more than exceeded our expectations". The Government of Brazil requested, (TOAID 2327, 4/18/66) that the study there include an evaluation of the First Fertilization Loan and agreed to provide the U. S. dollar equivalent of $10,000 in local currency to cover the cost of additional local hire interviewers, tabulators, etc., plus part of the local currency costs incurred by the contractor's planned research. The latter saved US dollar expenditures which would cover the costs of on-campus evaluation of the additional data. TCR and LA/BR concurred in this request because the additional

work was directly related to the research effort and the Brazilian Government contribution established their interest in the research results as well as their confidence in the competence of the investigators. USAID/Peru has informally discussed with the Ohio State University Project Director the possibilities of additional technical assistance in their agricultural credit problems which goes beyond the scope of the research contract and will have to be developed as a separate project. This interest has developed as a direct result of the research team's performance in Peru.

c. Known Uses of Results

While the material collected in Phase II did not yield the kind of analytical data hoped for, what is known about agricultural credit systems and their operations in the LDCs is for the first time adequately reported in a comprehensive bibliography prepared by the contractor which has been widely distributed to A.I.D. Missions and host country governments as well as to U. S. Government and private institutions concerned with international development. This is an important contribution to A.I.D.'s "memory" system and will prove extremely useful to other researchers in the field of agricultural credit. The analysis of the findings from Phase I contained in the contractor's publications listed above will also provide important guidelines for both planning and operations even if only in terms of what hasn't worked successfully. The contractor's research designs for the Phase II country studies and the carefully developed questionnaires, reporting, and tabulating forms designed for IBM use will be made available to A.I.D. Missions for their country studies as their effectiveness in providing pertinent information is established in the Phase III analytical process.

9. Plans for the Future

The research teams operating in Brazil, Ecuador and Peru will complete their studies by October, 1966 and return to the home campus to assist in the analysis of the data and preparation of the final report. The study in Colombia has been completed and the team is now working in Peru.

Two publications now in draft and scheduled for release by the contractor in September, 1966 are "Institutional Farm Credit in Colombia" and "Agricultural Credit in Taiwan".

Other studies to be prepared by the contractor's staff and the approximate date of publication are:

a. Report on the First Fertilizer Loan, Brazil - October, 1966.

b. Study of Credit Problems Associated with Land Acquisition - December, 1966.

c. Progress Report on Saturation Study - February 1967.

d. Capital Use in Developing Agriculture - April, 1967.

e. Problems of Agricultural Credit in an Inflationary Economy - June, 1967.

The remaining work on Phase II and the Phase III analysis and formulation of agricultural credit models for developing countries will be completed by October, 1967.

The usefulness to A.I.D. of expanding this research to cover additional case studies in other regions can be determined only by an evaluation of the contractor's final report by AID/W, the USAIDs and other appropriate agencies. Implementation of the research results will be in the form of USAID projects.

Signed: _____
Monitor

Approved: _____
Director, TCR/ARDS

DRAFT

Research Program

Date: September 12, 1966

Current Monitor: Douglas D. Caton
TCR/ARDS
or PC/

PROGRESS REPORT

Project Title: Analytical Study of AID/University Programs in Agricultural Education and Research in Less Developed Countries

Contractor (or U.S. Agency): Purdue Research Foundation

Origin : Solicited [ ] Unsolicited [x]

Status : Active [x] Completed [ ]

Duration: Date of initiation February 4, 1965

Date of completion (Actual or estimated) June 30, 1968

Cost : Total (Actual or estimated) $58,931 (planning) $ 1.2 million (research)

Obligations (through 6/30/66) $58,931 (planning) $940,000 (research)

Project Summary

Objective:

To determine the:

1. Effect of University-contract projects on host institutions.
2. Factors affecting development of institutions best suited to country needs.
3. Factors influencing the effectiveness of university-contracts for conveying technical assistance.
4. Effect on U.S. universities of the AID/University contract system.

Description:

1. A.I.D. and the National Association of State Universities and Land-Grant Colleges wanting to make improvements in AID/University contract relationships needed a factual and analytical base to strengthen decisions concerning rural development assistance provided through A.I.D. contracts with U.S. Universities.
2. The research focuses specifically on university-contract projects in the rural development field.
3. Throughout, the study is following a "cross-sectional" approach to the analysis of major aspects of university-contract assistance to developing foreign agricultural education and research institutions. The analyses of different factors influencing project effectiveness cuts across individual projects in search of principles having general significance. Interrelationships among these principles also will be examined and their validity tested against actual experience in significant representative situations.

DRAFT
9/12/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Analytical Study of A.I.D./University Programs in Agricultural Education and Research in Less Developed Countries

2. Contractor:

   a. Purdue Research Foundation, Lafayette, Indiana (fiscal and contracting agent for the "Big Ten" Midwestern Universities and the University of Chicago (CIC). The Central staff function is performed by the University of Wisconsin under a subcontract with the Purdue Research Foundation

Segment of Study	Cooperating University
Central Staff Function	University of Wisconsin
World-wide Analysis I	Purdue and Indiana Universities
World-wide Analysis II	University of Illinois
Literature Search and Contracting Documents Survey	University of Minnesota
African Region	Ohio State University
Latin America Region	University of Missouri
Far East Region	Utah State University
Near East and South Asia Region	North Carolina State University

   b. Principal Investigators

      Central Staff: Ira L. Baldwin and R. Wade Jones, University of Wisconsin, Madison

3. Contract

   a. Date Signed

      1. February 4, 1965 Phase I, planning
      2. June 25, 1965 Phase II, research

   b. Funding

      1. FY 1965 - $58,931 (planning)
      2. FY 1966 - $940,000 for first two years of a three-year contract

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3. FY 1967 - Estimated additional financing $243,000 to conclusion of the research

(Note: exact amount of third year financing will depend upon nature of problems and progress in the first two years)

4. Project Monitors

F. W. Parker	February 1965 - December 1965
D. D. Caton	January 1966 - present

5. Origin of Project

A.I.D. and the National Association of State Universities and Land-Grant Colleges wanting to make improvements in AID/University Contract relationships needed a factual and analytical base to strengthen decisions concerning rural development assistance provided through A.I.D. contracts with U.S. Universities.

The proposal was sponsored by the Association and developed by an executive committee of the midwest universities on Institutional Cooperation (CIC). At the same time an advisory committee representing the "Big Ten" schools was appointed to counsel on research, and to coordinate the multi-university approach.

II. Evaluative Information

6. Description of the Project

a. General

A.I.D. has actively encouraged the development of institutions for agricultural education (including extension) and research in the less developed countries through financing of technical assistance contracts with U. S. universities.

During the past 15 years, A.I.D. has assisted the development of more than 50 foreign agricultural education and research institutions in 30-odd countries through contracts with some 35 U. S. universities. These projects have involved more than $85 million of U. S. foreign assistance funds and substantial investments by the aid-receiving countries.

Informed opinions regarding the factors which influence the effectiveness of such assistance projects are both varied and numerous. There is little tested evidence, however, as to which factors are the most important or how and to what extent particular factors influence project effectiveness under different circumstances. This study is expected to provide such evidence.

Four interrelated questions are being explored in such depth as available data permit and the usefulness of prospective results warrant: (a) the effects of university-contract projects upon host institutions, with particular regard to the kinds of changes involved in the development of an institution, how change takes place, what influences its rate and how change becomes self-generating; (b) factors affecting the types of agricultural education and research institutions best suited to a country's needs; (c) factors influencing the effectiveness of the university-contract project device for conveying technical assistance; and (d) effects on U. S. institutions of their participating in international rural development assistance.

Throughout, the study is following a "cross-sectional" approach to the analysis of major aspects of university-contract assistance to developing foreign agricultural education and research institutions. The analyses of different factors influencing project effectiveness cuts across individual projects in search of principles having general significance. Interrelationships among these principles also will be examined and their validity tested against actual experience in significant representative situations.

The research focuses specifically on university-contract projects in the rural development field. All active and expired projects will be studied to some extent but in varying degrees of detail, and those likely to prove of limited usefulness will be dropped. Data collection will be so directed as to provide maximum useful information on each specific issue at least cost. Different projects will be "best sources" for different purposes. The selectivity permitted by this approach will enable examination of a wide range of relevant issues without collecting an excessively burdensome amount of data.

Phase I of this project, which dealt with the development of a study plan, has been essentially completed. The main features of the proposed operational plan for Phase II are set forth below. Prior to its submission to A.I.D., the comprehensive Interim Report underlying this proposed operational plan was reviewed and endorsed by (a) the Project Advisory Committee, (b) the CIC, and (c) the Rural Development Subcommittee of the National Association of State Universities and Land-Grant Colleges. The University of Wisconsin, which carried out the work on Phase I under a subcontract with PRF, provides direction for coordinating and integrating the Phase II research.

It is estimated that Phase II will require about three years to complete. Total costs for the three-year period are estimated at approximately $1.2 million. Initial funding of $240,000 will

cover the estimated requirements during the first two years. The budget item "PRF Fee" covers costs, not included elsewhere in the budget, for services to be provided by PRF as co-ordinator for the subcontractors.

As the worldwide analyses will proceed concurrently with the collection of data, essentially final conclusions will have been reached with respect to a number of the major factors being studied by the end of the second year. These findings, and the analytical materials from which they were drawn, would in and of themselves have considerable value to A.I.D.

In particular, this research should provide A.I.D., its university contractors and cooperating countries with: (a) experience-based principles regarding major determinants of project success, (b) criteria of progress in institutional development, (c) an assessment of what has been accomplished by the cooperative program thus far and the costs of institutional development under varying circumstances, and (d) some indications of the types of rural development assistance -- in addition to building foreign agricultural colleges and universities -- for which the capabilities of U. S. land-grant and other universities could be employed advantageously. As indicated, major segments of the study are assigned to individual universities. The several parts are being closely coordinated by the central staff. Both the staffing of the participating universities' activities and the integrating efforts of the central staff stress inter-disciplinary consideration of factors influencing institutional development and their interrelationships.

b. Progress Under Phases I and II

Phase I of the study -- which was brought to a close on August 20, 1965 -- defined several broad substantive and operational parameters for Phase II of the CIC-AID Rural Development Research Project. In particular, these guidelines were designed to (a) concentrate the research upon producing the kinds of insights deemed likely to be the most useful in strengthening the effectiveness of AID-University contract technical assistance efforts, (b) maximize opportunity for capitalizing upon the flow of findings in further refining the focus upon lines of investigation which in fact prove especially fruitful and (c) provide an adequate basis for generalizing principles without excessive collection of detailed data.

More specifically, the Phase I planning:

(1) Defined as the central purpose of the study the strengthening of the research base for A.I.D. and University

decisions pertaining to cooperative technical assistance programs in agricultural education and research.

(2) Made a June 30, 1968 completion date and a "reasonable" budget the determinants of the upper limit upon the feasible scope for this research.

(3) Established the general and specific objectives of the study -- as concretely as then-available knowledge permitted -- in terms of the kinds of research results which would best contribute to achieving the central purpose of the study.

(4) Designed an organization for carrying out the research which was judged best suited to (a) bringing a broad multi-disciplinary approach to bear on the problem, (b) enabling the collection of data and the analyses to proceed concurrently and (c) conducting the several segments of the research as integral parts of a single overall study.

(5) Visualized a research procedure based primarily upon the testing of logically-derived hypotheses and the cross-sectional analysis of projects as means of obtaining optimum depth of coverage of priority areas with a minimum investment in data collection and processing.

(6) Recognized the importance to the quality of the final product of joint participation by those responsible for the different segments of the research in developing the detailed research design and investigation procedures.

Phase II has thus far been concerned with improving research method, developing and testing field data collection procedures, posting field investigators and developing field survey methods abroad, and generally getting the research underway. These activities can be summarized as follows:

(1) Contract -University files search

A great deal of factual material useful for the present research is contained in the contract-universities' files on individual projects.

(2) Understanding AID/University contract operations

The information on AID/University contracts available to the research group was primarily that contained in A.I.D. program and contract documents.

Three overseas activities -- plus substantial Stateside work -- have been utilized:

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(a) Reconnaisance surveys

Visits were made to 21 countries in the Africa, Far East, Latin America and Near East South Asia Regions between September 1965 and February 1966 -- i.e. prior to permanent posting of the four Senior Overseas Researchers (SORs) to their respective Regional headquarters.

(b) Initial overseas operations

The guidelines given the SORs on the overseas work to be carried out during the February-May 1966 period included--and emphasized--the following statements:

> ...."In addition to information about specific projects, it is important that we learn a great deal more than we presently know about the overall institutional structure serving agriculture in the countries where they are located. This can be deferred to a later period where it is not easily obtainable. As country visits are made, however, every effort should be made to round out the general information on both the projects and their settings while there."

(c) Field testing of preliminary data-collection instruments

A significant by-product of this major activity was its contribution to further broadening of the Research Group's knowledge about the subject and universe under study.

(3) Technical assistance theory

A preliminary draft of a theory of how the technical assistance process operates has been developed.

(4) Identification of priority research areas

Experience gained has enabled substantial progress on refining the statements of Objectives set forth in the Operational Plan and a better integration of the General and Specific Objectives of the study.

(5) Methodology

Organizationally, the CIC-AID Rural Development Research Project is, in a way, an experiment in team-research methodology. By design, it is not only multi-disciplinary in its content and staffing, but also multi-institutional in its implementation.

(a) Workshops

The strength of multi-disciplinary research and a sharing of responsibility among several universities lies in the different backgrounds and interests brought to bear upon the complex subject under study. The entire Research Group has come together in 5 Workshops of 2 - 10 days duration. Several smaller meetings at more frequent intervals -- particularly among the Stateside Analysts -- have further contributed to the pooling of ideas on subject matter and analytical approaches.

(b) Overseas testing of instruments

A comprehensive set of questionnaires was developed and field-tested in the four Regions. The primary purposes were to deepen understanding of the kinds of evidence which practicably could be obtained from overseas sources; to test the feasibility of the multipurpose questionnaire approach; and to provide opportunity for the Analysts and SORs to pool their ideas.

(6) Evolution of A.I.D.-University cooperation in international rural development assistance

The expectation was that a systematic analysis of the history of A.I.D.-University relations would enhance understanding of decisions taken with respect to particular projects, policies or practices.

(7) Selective bibliography of reference materials

This service-oriented special activity was included in the Operational Plan for Phase II to facilitate the use of the literature especially pertinent to the purpose of the CIC-AID Rural Development Research Project by members of the Research Group.

7. Contractor Performance

The CIC group, which carried out Phase I of this project, is exceedingly well qualified to carry out Phase II. The organization is held in high esteem by the academic community and is uniquely situated to command the capabilities of its member institutions. Most of the researchers have worked on A.I.D. contracts.

The Project Director (half-time) is Dr. Ira L. Baldwin, formerly Dean of the Graduate School, Dean of the College of Agriculture, and Vice President of the University of Wisconsin. Since 1958 Dr. Baldwin has served as Special Assistant to the President of the University and was the first Director of the International Rural Development Office of the Association of State Universities and Land-Grant Colleges.

Assisting Dr. Baldwin is a competent full-time Associate Director, and professors or associate professors with special research competence in agriculture or education on the faculties of the subcontractor universities.

8. Evaluation of Results

See sections 6 and 7, above. Also:

The strength of the multi-university approach -- with responsibility for various aspects of the work lodged with nine different universities -- lies in the fact that it brings to the research the competencies of experienced researchers representing a wide range of intellectual disciplines and an equally wide range of background experiences. The weakness of this approach lies in the difficulty of securing a concensus on the topics to be investigated in depth and on the closely related problem of allocating the time of the Overseas Researchers for the collection of the data which is needed for each of the proposed sub-projects.

9. Plans for the Future

See sections 6 and 7, above. Also:

In April 1966, a paper, "Extending the Conceptual Framework", was prepared and in June 1966, the following topics were outlined:

1. "Topic Areas and Major Questions"
2. "Some Further Implications of Overall Concepts"
3. "Operational Objectives of June 13 - 23 Seminar"

and the following papers prepared at the Boulder Workshop:

1. TAC Strategy and Tactics
2. University Backstopping Organization
3. Project Documents and Evaluations
4. Study Proposal for Special Far East Assignments
5. Project Descriptions
6. Country Needs

The documents prepared at the Boulder Workshop are now being used as the basis for data collection by the Overseas Researchers. These documents are expected to be revised, amplified and polished by the Analysts as they study and analyze the overseas data which is now beginning to reach them. In addition, the Analysts are expected to prepare additional research sub-projects covering their areas of responsibility prior to October 1.

The material requested from the files of the U. S. Universities is now flowing in rapidly. This is now being classified and filed and some preliminary tabulations have been started.

The Illinois group, much of whose work deals with Stateside data, are developing detailed research projects covering those aspects of the overall research project which are dependent upon Stateside data. They have made limited studies at other institutions of the availability of certain types of data.

The sub-projects which were developed at the Boulder Workshop and those now being developed by the Analysts cover a large part of the items considered by the director to have top priority. They do not encompass all of the items suggested under the title of "Topic Areas and Major Questions". The workload, and its contributive significance, will need to be considered carefully before additional aspects are included. These requirements will be reviewed in a workshop scheduled for November 14 - 18, 1966.

Signed: _____
Monitor

Approved: _____
Director, TCR/ARDS

DRAFT

Research Program

Date: 9/14/66

Current Monitor: Mr. John R. Wilson
TCR/ ARDS
or-PC/

PROGRESS REPORT

Project Title: Inheritance and Improvement of Protein Quality and Content in sorghum vulgare Pers.

Contractor (or U.S. Agency): Purdue Research Foundation

Origin : Solicited [ ] Unsolicited [x]

Status : Active [x] Completed [ ]

Duration: Date of initiation June 30, 1966

Date of completion (Actual or estimated) June 30, 1971

Cost : Total (Actual or estimated) $511,200

Obligations (through 6/30/66) $315,000

Project Summary

Objective: To screen the "world collection" (5000 lines) of sorghum for high total protein content and high lysine and other essential amino acid content to locate lines exhibiting both high protein content and an improved amino acid balance. These lines will be made available to plant breeders worldwide. The lines containing a high proportion of lysine will be combined with other high protein - high lysine lines to develop new breeding stock containing a higher percentage of protein and this essential amino acid than occurs naturally. There new lines will then be distributed to plant breeders in cooperating countries.

Description: The"world sorghum collection"(5000 lines) will be screened for high protein and high lysine lines in an effort to find varieties having desirable nutritional qualities for human consumption. These lines will be crossed and increased to further improve them and for distribution to sorghum breeders in the LDCs for inclusion in country breeding and production programs. The lines will be grown in Indiana, Mexico and Costa Rica and the breeding work will be done at Purdue and in the cooperating countries. The testing for Protein Content and Quality will be done at Purdue and by a private laboratory. About 15 countries have indicated that they want to cooperate with this program at the present time.

DRAFT 9/14/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Inheritance and Improvement of Protein Quality and Content in sorghum vulgare Pers.

2. Contractor: Purdue Research Foundation, Contract No. AID/csd-1175

   Principal Investigator: Dr. Robert Pickett, Professor of Agronomy, Purdue University

3. a. Date of Signing Contract: June 30, 1966

   b. Funding: FY 1966 - $315,000 (for three years) This is a five year contract with a total estimated cost of $511,200.

4. Project Monitor: John R. Wilson, TCR/ARDS

5. Origin of Project: The original project proposal was unsolicited. After review by TCR, the Regional Bureaus, the U.S.D.A., and others, the project was revised to include cooperation with plant breeders in the less developed countries, in the U.S.D.A. and in the Rockefeller Foundation.

II. Evaluative Information

6. Description of Project:

a. To screen the "world collection" (5000 lines) of sorghum for high total protein content and then to screen those showing high protein content for high lysine and other essential amino acid content to see if there are lines in the collection exhibiting simultaneous high protein content and an improved amino acid balance. If so, these lines would immediately be made available to plant breeders world wide. The lines showing promise of containing a high proportion of lysine in the initial screening will be combined with other high protein - high lysine lines to develop new breeding stock containing a higher percentage of protein and this essential amino acid than occurs naturally. These new lines will then be distributed to plant breeders in cooperating countries. The principal investigator will help set up the adaptive research. Later, other essential amino acids will be increased in the same way.

Sorghum is the third most important cereal crop in the world and is the most important cereal and source of energy for many millions

of people in the less developed countries. While it is a good source of carbohydrates and a fair source of total protein (ranging from under 9% to over 18% total protein), the protein quality is poor, being very low in lysine, threonine, and tryptophane and possibly isoleucine and methionine, all being essential amino acids for humans and non-ruminant animals.

In 1965, Dr. R. C. Pickett conducted experiments which showed a considerable range of lysine content - 1.30 grams to 2.66 grams of lysine per 100 grams of protein. Some of the high lysine lines were associated with relatively high protein lines (2.63 grams of lysine per 100 grams of protein in a line containing 14.6% protein). Therefore, it seems possible to get a large increase in total protein content and to improve the lysine content at the same time. If this is possible, then by breeding the gene responsible for this characteristic into sorghum lines being used all over the world, total protein and total lysine in the diets of the people consuming sorghums can be increased at a very low cost, thereby improving their diet without materially affecting their food habits.

The other essential amino acids will be developed in the same manner so that eventually, the total protein and total essential amino acid content of the breeding stock available to plant breeders in the LDCs will be cataloged and the procedures and plant materials to be used for best results will be known and in use.

An intensive study will also be made of the protein chemistry involved and of the inheritance of protein quantity and quality.

About 2000 samples of sorghum per year will be studied, 1000 from the world collection and 1000 from the breeding program.

Purdue has made institutional arrangements for winter multiplication of the lines not producing seed under Indiana conditions in Puerto Rico and Mexico, and have already started work under the project. They have a large number of promising lines planted this season in Indiana and expect to have some seed for distribution to cooperating plant breeders by the end of 1966.

The scope of work as it appears in the contract is shown below.

"ARTICLE I - STATEMENT OF WORK

For a period as hereinafter set forth herein, the Contractor shall make available and employ its research and technical resources and personnel at the level of effort hereinafter set forth to perform a research and analysis program directed toward increasing of protein quality and content in sorghum vulgare pers. The work

during this program shall include, but not necessarily be limited to the following:

A. To improve the protein quality and content of the sorghum grown and eaten in the developing countries by isolating lines contained high total protein content and high protein quality. These lines will then be incorporated into high yielding inoreds and hybrids. The breeding stock will be made available to sorghum breeders to use in developing locally adapted varieties and hybrids giving high yields, and containing high levels of the essential amino acids - lysine, threonine, tryptophane, isoleucine and methionine. This project will make a significant contribution toward improving the quantity and quality of food consumed in the sorghum growing areas and will improve the quality of output from cooperating research institutions in the less developed countries.

B. The widest possible array of sorghum genotypes from diverse sources will be tested for total nitrogen and lysine content. The world sorghum collection, from Purdue University and Rockefeller Foundation in India, and material from breeders in the U.S., Asia, Africa, and Latin America will be tested. All samples being compared will be grown under similar conditions of climate and soil fertility. These samples not heading at Purdue (because of day length) will be grown in Mexico or Puerto Rico. Interaction of protein quality and amount will be studied by use of the Purdue soil high fertility block. As high lysine lines are identified, they will be further screened for other limiting essential amino acids such as threonine, tryptophane, methionine and isoleucine.

C. Intercrosses will be made between promising lines and between lines with contracting levels of the different essential amino acids in an effort to build up the protein and essential amino acid content to levels higher than those found in the original material.

D. Two thousand or more total nitrogen determinations will be made annually using the Kjeldahl procedure. Complete amino acid analysis will be done at Purdue on selected lines. Lysine determinations will be made by short column chromatography or by a dye absorption method being developed as a screening technique. Tryptophane will be analyzed by the Spies-Chambers method. Other suitable extraction methods will be used to study the alcohol soluble, alkali soluble, and acid soluble fractions of the endosperm and embryo of select samples. Purdue University will establish a laboratory for analysis and control, but much of the analysis work will be done by a private laboratory near the campus.

E. The biological value of selected high protein content samples will be tested by rat feeding experiments. Later, the Animal Science

Department will conduct experiments using selected material on poultry and swine at no charge to A.I.D.

F. All data will be put on punch cards and print out sheets. Data and improved lines of sorghum seed will be made available to cooperators in breeding programs around the world."

b. Dr. Pickett departed September 11, 1966 for Africa and Asia to contact plant breeders in the sorghum producing countries to further inform them about this project, and to help them set up programs whereby they can incorporate this new breeding material in their country's sorghum breeding and production program. He has about ten acres of land planted to representative lines of sorghum at Purdue this year. They have purchased and installed a Beckman Amino Acid Analyzer and have signed a contract with a private laboratory to make the total protein determinations. This laboratory has completed the total protein analysis of 213 samples from the Purdue plots and found that they ranged from less than 10% to more than 25% total protein with the highest sample containing 25.7% total protein (an average of 3 tests). Several graduate students have been employed to do some of the field work and one man is undergoing training on operating the Amino Acid Analyzer.

7. Contractor Performance:

Even though he had no contract, Dr. Pickett went ahead and planted about 10 acres of sorghum at Purdue, including lines that he had tested earlier to avoid the loss of one year. He also has made a number of cross pollinations as a start toward determining the inheritance of Amino Acid patterns and to develop improved lines for distribution. He has also completed arrangements for securing all of the lines in the world collection. He has purchased and set up the amino acid analyzer, signed a contract with a private laboratory for additional testing, and has started communicating with sorghum breeders in the LDCs. He will have about 600 pounds of seed of high performance lines for distribution during the winter of 1966-67.

8. Evaluation of Results

Considering that the contract was signed on June 30, 1966, the progress being made under this project is superior. Purdue University and Dr. Pickett have rendered a real service to AID by going ahead with this project before the contract was signed. (A year would have been lost if they had waited until after the 30th of June to try planting their seed).

9. Plans for the Future

When Dr. Pickett returns from Asia and Africa, he will complete analysis of the samples harvested this fall and then make his plantings in Puerto Rico and Mexico. Lines having high total protein and a desirable amino acid pattern, if enough seed is available, will be distributed to cooperating plant breeders in the LDCs. Desirable lines for which seed is scarce will be increased during the winter. "Print out" sheets from the analyzer will be duplicated and sent to all cooperators. Dr. Pickett will start an intensive breeding program in the summer of 1967 based on the results of the 1966 work, to develop new lines having improved amino acid patterns at varying levels of total protein.

Signed: _____
Monitor

Approved: _____
Director, TCR/ARDS

DRAFT

Research Program

Date: September 15, 1966

Current Monitor: John R. Wilson
TCR/ ARDS
or PC/

PROGRESS REPORT

Project Title: Improvement of Nutritional Quality of Wheat Through Increased Protein Content and Improved Amino Acid Balance

Contractor (or U.S. Agency): University of Nebraska

Origin : Solicited [ ] Unsolicited [XX]

Status : Active [XX] Completed [ ]

Duration: Date of initiation June 29, 1966

Date of completion (Actual or estimated) June 30, 1976

Cost : Total (~~Actual or~~ estimated) $744,331

Obligations (through 6/30/66) $371,350

Project Summary

Objective: The overall objective of this research project is the improvement of the nutritional value of wheat in the LDCs by increasing protein content and improving the amino acid balance. Genes that increase the protein content of wheat by as much as 25 percent already have been identified through cooperative Nebraska/USDA research. These will be incorporated into the best local varieties in the LDCs.

Further objectives of this project will be (1) the identification of genotypes among the world wheat collections that contain higher lysine contents than existing varieties, and (2) complete amino acid profiles will be determined for the high lysine genotypes to identify those with the highest nutritional potential.

Description: The association of high lysine with soft endosperm may provide an efficient method of selecting the potentially most promising lines in wheat for preliminary screening. The further association of lysine with the water soluble proteins provides the possibility of a rapid screening technique. A modified Beckman-Spinco amino acid analyzer offers dual possibilities; first, as a screening device using four short columns and, second, to evaluate promising lines for the complete amino acid profile. Working relations with the principal research agencies of the LDCs will be established in the first year. Initially, the best varieties of wheat from each country will be obtained for crossing with the Nebraska high protein selections. Since these are winter wheats, whereas in most LDCs spring wheats are grown, it will usually be necessary to make the initial crosses in Nebraska where vernalization of the high protein winter lines can be accomplished. F_1 or F_2 seed will be returned to the cooperating investigators in the LDCs for production and screening. As high lysine genotypes are identified, they will be injected into the breeding programs in the LDCs.

DRAFT 9/14/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Improvement of Nutritional Quality of Wheat Through Increased Protein Content and Improved Amino Acid Balance

2. Contractor: University of Nebraska, Lincoln, Nebraska
Contract No. AID/csd-1208

Principal Investigators: P. J. Mattern, V. A. Johnson, and J. W. Schmidt, Department of Agronomy

3. a. Date of Contract Signing: June 29, 1966

b. Funding

FY 1966 - $371,350 (First three years)
Total - $744,331 (Estimated)

Note: Estimated duration of project is 10 years

4. Project Monitor:

John R. Wilson, June 30, 1966 - present

5. Origin of Project:

The world food shortage can be divided into two components: under-nutrition and protein malnutrition. One means of improving the quality of the diet and alleviating malnutrition is to increase the protein from the cereal grains. One of the cereals widely grown is wheat.

The contractor submitted an unsolicited proposal to undertake an examination of the world's wheat collection -- for high protein characteristics, start a plant breeding program for further varietal selection and adaptation, and to initiate a trial and adaptive research program in representative areas abroad.

II. Evaluative Information

6. Description of Project

a. The overall objective of this research project is the improvement of the nutritional value of wheat in the LDCs by increasing protein content and improving the amino acid balance. Genes that increase the protein content of wheat by as much as 25 percent

already have been identified through cooperative Nebraska/USDA research. These will be incorporated into the best local varieties in the LDCs. The existing high protein lines have normal levels of the nutritionally limiting amino acids-lysine, methionine and threonine. Because of their higher protein content, they provide more of these amino acids than lower protein varieties. Further enhancement of the nutritional value of wheat can be accomplished by optimizing amino acid balance. Therefore, a primary objective of this project will be (1) the identification of genotypes among the world wheat collections that contain higher lysine contents than existing varieties, and (2) complete amino acid profiles will be determined for the high lysine genotypes to identify those with the highest nutritional potential. Identified high lysine (genotypes) will be crossed with adapted high protein selections in the LDCs. The stability of phenotypic expression of the high protein and high lysine traits in different geographical areas will be tested.

The LDCs in South America, Africa, and Asia in which wheat is a major food source, will be surveyed to locate institutions through which this research can be conducted and in which the capability for conducting research and training local scientists in plant breeding and bio-chemistry can be enhanced. Brazil, Colombia, Turkey, Tunisia, and India are possibilities being considered at the present time.

b. There has been no systematic evaluation of the world's wheats to identify genetic differences in lysine. Genes for high protein in wheat have only recently been identified. Consequently, there has been little effort to date, except at the Nebraska Experiment Station, to breed for higher protein in wheat.

The association of high lysine with soft endosperm may provide an efficient method of selecting the potentially most promising lines in wheat for preliminary screening. The further association of lysine with the water soluble proteins provides the possibility of a rapid screening technique. A modified Beckman-Spinco amino acid analyzer would offer dual possibilities; first, as a screening device using four short columns and, second, to evaluate promising lines for the complete amino acid profile.

Working relations with the principal research agencies of the LDCs will be established in the first year. Initially, the best varieties of wheat from each country will be obtained for crossing with the Nebraska high protein selections. Since these are winter wheats, whereas in most LDCs spring wheats are grown, it will usually be necessary to make the initial crosses in Nebraska where vernalization of the high protein winter lines can be accomplished. F_1 or F_2 seed will be returned to the cooperating

investigators in the LDCs for production and screening. As high lysine genotypes are identified, they will be injected into the breeding programs in the LDCs. The flow of lines and breeding stocks between the United States and the LDCs to assure efficient and rapid evaluation of promising lines and varieties will be encouraged. Guidance will be provided by the project personnel to assure the establishment and operation of efficient research efforts in the host institutions of the LDCs and the development of local research competence. Cooperation with other research agencies and institutions in the U.S.A. will be established in research areas of mutual interest and need.

c. Wheat is a major food crop in many LDCs and is the major source of protein in the world today. Its nutritional improvement, therefore, would have an immediate impact on the adequacy of human diet in these countries. The shortage of wheat breeding capability in the LDCs has been often noted, and as in the United States and Western Europe, these wheat breeders have concentrated on increasing wheat yields and on "improved baking qualities", which has meant improved baking qualities for white bread with little importance attached to protein quality. Wheats with hard milling qualities and yielding a high loaf volume tend to have glutens with water insoluble characteristics while lysine and some of the other essential amino acids are water soluble. Therefore, selection of wheat for high bread quality over the years may have resulted in wheat varieties with lower rather than higher lysine content.

Nutritionally improved wheats would encounter no discrimination in the LDCs arising from established eating habits provided they possess quality characteristics similar to existing varieties.

High protein lines available at the Nebraska Experiment Station exhibit a wide array of kernel texture and other quality characteristics. Thus, it should be possible to transfer the high protein traits to the wheat types produced in the various LDCs. Likewise, associations of high lysine with soft endosperm should offer no obstacle in the LDCs since in most, soft textured varieties predominate.

Below is the scope of work for this project as given in the contract:

"ARTICLE I - STATEMENT OF WORK

For a period as set forth in Schedule Article V entitled "Period of Contract", the Contractor shall make available and employ its research and development facilities and personnel at the level of effort set forth in Schedule Article IV entitled "Level of Effort", and shall perform a

research and development program directed toward the improvement of the nutritional quality of wheat through increased protein content and improved amino acid balance.

A. Objectives

The objectives of this Contract are:

(1) To systematically evaluate the world wheat collection for significant differences in lysine content of different wheat varieties and types;

(2) To obtain complete amino acid profiles on high lysine lines found in "(1)" immediately above;

(3) To test the high lysine lines in different locations to determine the effect of environment and the stability of the high lysine genotypes under varying conditions;

(4) To introduce known high lysine genes in commonly grown local varieties; and

(5) To locate new sources of high lysine and high protein in wheat.

3. Duties

To achieve the objectives of this Contract the Contractor shall perform the following duties:

(1) Establish working relations with the principal research agencies of the less developed countries by visiting and corresponding with selected countries as designated by A.I.D.

(2) Select the best varieties of wheat from each country for crossing with the Contractor's high protein selections.

(3) Return the resulting hybrid seed to the cooperating investigators in the less developed countries for production and screening.

(4) Screen the world collection of wheats and varieties submitted by plant breeders for high lysine identification.

(5) Inject identified high lysine genotypes into the breeding programs of the less developed countries.

(6) Encourage the flow of lines and breeding stocks between the United States and the less developed countries to assure efficient and rapid evaluation of promising lines and varieties.

(7) Provide guidance and training to assure the establishment and operation of efficient research efforts in the less developed countries and the development of local research competence.

(8) Establish cooperative relationships with other institutions and research agencies in the United States in research areas of mutual interest and need.

(9) Reproduce all data developed hereunder on electronic data processing cards and print out sheets, and make this data available to cooperating plant breeders.

(10) Increase and make available to cooperators and plant breeders in the less developed countries high lysine and high protein lines, crosses involving high lysine materials, and other materials having improved amino acid content and balance."

7. Contractor Performance

The University of Nebraska is well qualified to conduct the proposed research. A wheat quality laboratory was set up in the Department of Agronomy in 1960 and has been equipped with specialized equipment for conducting basic and applied research in various phases of wheat chemistry. The laboratory is now carrying on research on wheat proteins and has completed preliminary screening of the first three nutritionally limiting amino acids (lysine, methionine and threonine) in Nebraska high protein wheats using microbiological techniques.

The principal investigators have had many years of experience in their respective fields. Dr. Mattern has published over 15 manuscripts on subjects related to this proposal; Dr. V. A. Johnson has published over 20 articles on wheat breeding and the development of varieties suited for special production conditions or for special purposes; and Dr. J. W. Schmidt has written over 16 articles dealing with the various aspects of plant breeding.

While Atlas 66 wheat (a high protein variety) was developed at North Carolina State University many years ago, Nebraska has been the only research institution in the U. S. that has attempted to do much with it in developing locally adapted high protein

varieties. As a result, there are now several Nebraska high protein varieties being experimentally produced and the variability of the amino acid pattern in these varieties gives hope that varieties containing the desired characteristics can be developed rapidly.

Excellent progress is being made on this research. The contractor has: 1) purchased a Beckman auto-analyzer, 2) completed training on its use, 3) hired a postgraduate Ph.D. candidate, a secretary-technician, a technician with an MS degree, and a greenhouse technician, 4) extended greenhouse facilities, 5) planted varieties in greenhouse for crosses to be made in April, 6) has brought Dr. Craddock, in charge of world wheat collection, to Lincoln for advice and consultation, and 6) established means of exchanging seed with the LDCs so that the high protein crosses are made in the United States and the seed is then sent for adaptation trials to its home country. Out of this, and its previous work, the Nebraska group is ready to make crosses (as indicated above) in April of high protein lines and country lines.

8. Evaluation of Results

The results to date indicate a high degree of accomplishment, and forecast an excellent future for this project in terms of usefulness of findings with regard to the world's food problem.

9. Plans for the Future

Dr. Mattern and the senior wheat breeders on this project will soon visit cooperating countries to assist in selecting additional locally adapted varieties for inclusion in the protein improvement program and to help the local wheat breeders plan an adaptive research program to incorporate the material developed under this project into the most widely grown varieties as soon as possible. The screening of the world collection for additional sources of improved protein content and quality will be started in the fall of FY 1966. The results of this project, in the form of reports and plant material, will be made available to all cooperating countries, USAID missions, institutions, and individuals on a continuing basis.

Signed: _____
Monitor

Approved: _____
Director, TCR/ARDS

DDCaton:TCR/ARDS:9/15/66

DRAFT

Research Program

Date: September 14, 1966

Current Monitor: Douglas Caton
TCR/ARDS
~~ERC~~/ _____

PROGRESS REPORT

Project Title: Demand Prospects for Agricultural Exports of Less Developed Countries

Contractor (or U.S. Agency): Economic Research Service, U.S. Dept. of Agriculture

Origin : Solicited [ ] Unsolicited [x]

Status : Active [x] Completed [ ]

Duration: Date of initiation June 1, 1966

Date of completion (Actual or estimated) May 31, 1969

Cost : Total (Actual or estimated) $840,000

Obligations (through 6/30/66) $ 70,000

Project Summary

Objective: The project proposes to identify the demand schedule for the agricultural exports of the less developed countries. It will attempt to determine the price and income elasticity of demand for these products in both the established markets in the developed countries and in the LDC's and the transitional countries. It will attempt to differentiate different commodities according to their relative elasticities in both the short and the longer run. The first step will be the determination of historical trends among commodities of each type.

Description: Detailed demand analysis will be made for individual commodities of various types: those traditionally produced almost entirely in the LDC's for sale in established developed country markets, such as coffee, cocoa, and jute; those suited for production in the LDC's for which new markets may be emerging in the developed countries, such as exotic fruits and nuts; those which are produced also for export by developed countries, such as cotton, sugar, and rice; and those, including the above, which may be becoming important in new trade patterns among the less developed and transitional countries. Attempts to measure elasticity will be made largely from historical price-quantity relationships, supplemented by examination of consumption patterns for these commodities in different categories of importing countries. These demand determinations will be traced out into patterns of implications of alternative supply assumptions. These assumptions will be based upon such things as FAO estimates, USDA estimates, and country models.

DRAFT 9/14/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Demand Prospects for Agricultural Exports of Less Developed Countries

2. Contractor: Economic Research Service
U. S. Department of Agriculture

Principal Investigators: "Research leadership team" composed of Martin Abel, A. W. Mackie, A. S. Rijko, and Raymond Christensen, representing four Divisions of ERS

3. a. Date of Signing Contract: June 30, 1966

b. Funding

FY 1966	-	$ 20,000	(actual)
FY 1967	-	220,000	(estimated)
FY 1968	-	250,000	(estimated)
FY 1969	-	250,000	(estimated)
FY 1970	-	100,000	(estimated)

4. Project Monitor:

Douglas D. Caton - May, 1966 - present

5. Origin of Project:

A need exists to have an indication of world demand by major export commodity and probable sources of supply on a volume and price basis, together with demand and supply projections over a significant time period. It is required for a variety of purposes, including the development of agricultural sector plans for the less developed countries.

Given this need of A.I.D., on the basis of mutual understanding and appreciation of the requirement, this project was prepared by ERS as a joint undertaking of its several Divisions.

II. Evaluative Information

6. Description of Project

a. The project proposes to identify the demand schedule for the agricultural exports of the less developed countries. It will attempt to determine the price and income elasticity of demand

for these products in both the established markets in the developed countries and in the LDC's and the transitional countries. It will attempt to differentiate different commodities according to their relative elasticities in both the short and the longer run. The first step will be the determination of historical trends among commodities of each type.

Detailed demand analysis will be made for individual commodities of various types: those traditionally produced almost entirely in the LDC's for sale in established developed country markets, such as coffee, cocoa, and jute; those suited for production in the LDC's for which new markets may be emerging in the developed countries, such as exotic fruits and nuts; those which are produced also for export by developed countries, such as cotton, sugar, and rice; and those, including the above, which may be becoming important in new trade patterns among the less developed and transitional countries. Attempts to measure elasticity will be made largely from historical price-quantity relationships, supplemented by examination of consumption patterns for these commodities in different categories of importing countries. These demand determinations will be traced out into patterns of implications of alternative supply assumptions. These assumptions will be based upon such things as FAO estimates, and country models. This type of demand analysis imposes stringent methodological requirements both with respect to the reliability of the data and the econometric analysis.

b. Additionally, an investigation has been undertaken to strengthen and broaden the study possibly with regard to world food supplies forthcoming from developed countries by tieing the study in with the proposed FAO World Indicative Plan. This would be done under specific procedures requiring a team composed of senior ERS agricultural economists and a fertilizer expert-economist from the TVA staff. Briefly, the World Indicative Plan is to (1) make supply and demand projections (for both 1975 and 1985) of various agricultural commodities, both those involved in import-export trade and those produced for domestic consumption, and (2) indicate the kinds of actions -- policies, inputs and institutional measures needed by the less developed countries to meet the targets projected for the various commodities.

It should also be added that this research, as indicated, will provide essential estimating parameters for the intensive country studies now being formulated, including the methodology for these agricultural sector and country studies.

7. Contractor Performance

The U. S. Department of Agriculture is uniquely qualified to provide the type of data required for this analysis. Much of the data needed are not available in published sources, and those which have been published need to be further scrutinized and examined within the countries from which they originate. The Foreign Agricultural Service and the Regional Analysis Division are uniquely positioned to perform this function.

The peculiar analytical skills called for by the study are positioned in several, rather than a single place in the USDA. Administrative responsibility for drawing these resources together will be centralized in the Foreign Development and Trade Division of the Economic Research Service.

Substantial progress has been made on methodological issues, and an overall work plan for the study and work plans for individual time periods have been completed. The monitor serves as advisor and consultant to the methodology and work plan study group. Data on supplies, exports and trade available from FAO and USDA have been assembled and are being processed for major commodities. The tabular aggregations are being made on a trade and world basis.

8. Evaluation of Results

The indications are that the results of this project, besides supplying information necessary to country planning, will be of greater significance and magnitude than initially anticipated.

The significance of the study is that, faced with increasing requirements for foreign exchange, LDCs are individually placing high emphasis upon promotion of export crops. Inasmuch as these crops are in the main sold in the developed countries, it is anticipated that their aggregate demand is inelastic. In consequence, to the extent that the LDCs collectively produce a larger aggregate of these crops, total foreign exchange revenues may be diminished rather than increased. However, for some commodities and in certain countries (such as Japan) the elasticities may be considerably higher. And trade among the LDCs themselves may benefit from capitalizing upon comparative advantages. For AID to give competent advice and assistance to the LDCs on agricultural development policies, a firm understanding of the entire demand structure for agricultural commodities is necessary; agricultural products account for 55 percent of all export earnings of the LDCs, approaches 100 percent in some countries, and is less than 50 percent only in petroleum producing countries. A closely related problem derives from the fact that demand for agricultural commodities for domestic consumption within the LDCs is relatively much higher than for export commodities.

9. Plans for the Future:

A task force committee consisting of Dr. Martin Abel as Chairman, one representative from each of the Divisions in ERS, and Dr. Douglas D. Caton, TCR/ARDS, will be responsible for coordinating the development of the project, working out analytical details, and developing the methodology and models to be used in the analysis.

Discussions will be held with FAO covering three points: (1) nature and extent of possible participation in the research of the World Indicative Plan, (2) possible relationships and benefits to the AID/ERS demand and supply study on export commodities, and (3) probable improvements in obtaining and presenting agricultural data by country and by various levels of aggregation.

Interim reports, tabulations and analysis will be made available to AID/W and Missions as individual sections are completed. An overall comprehensive analysis is also anticipated.

Signed: Douglas Caton
Monitor

Approved: Douglas Caton
Director, TCR/ARDS

DCaton:TCR/ARDS:9/14/66

DRAFT

Research Program

Date: September 14, 1966

Current Monitor: Douglas D. Caton
TCR/ ARDS
~~FCX~~/XX

PROGRESS REPORT

Project Title: Agricultural Prices in Economic Development: Their Role, Function, and Operation.

Contractor (or U.S. Agency): Cornell University, Ithaca, New York

Origin : Solicited [ ] Unsolicited [XX]

Status : Active [XX] Completed [ ]

Duration: Date of initiation June 30, 1966

Date of completion (Actual or estimated) June 29, 1969

Cost : Total (Actual or estimated) $266,000

Obligations (through 6/30/66) $266,000

Project Summary

Objective: The proposed research has three broad areas of inquiry: (1) the role of prices in intersectoral capital and income transfers; (2) the effect of price relationships on agricultural production and marketings; and (3) the factors affecting urban food prices. Because of close interrelationships, work will proceed simultaneously on all three parts.

Description: The research consists of two phases in each of three parts of the study: I. The role of prices: (1) on terms of trade, and (2) intersectoral capital and income transfers; II. The effect of prices on production: (1) aggregate demand estimation (fertilizer), and (2) aggregate demand scheduling (water); and III. The factors affecting urban prices: (1) marketing margins and prices (milk), and (2) rice (tentative).

UNCLASSIFIED

Draft
9/14/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Agricultural Prices in Economic Development: Their Role, Function, and Operation.

2. Contractor: Cornell University, Ithaca, New York.

   Principal Investigator: Dr. John W. Mellor, Department of Agricultural Economics.

3. a. Date of Contract Signing: June 30, 1966.

   b. Funding:

   FY 1966 - $266,000 (Three years to completion, June 29, 1969)

4. Project Monitor:

   Douglas D. Caton, June 30, 1966 - present.

5. Origin of Project:

   Changes in agricultural price relationships have an important influence on intersectoral income and capital transfers; they are a potentially important device of public policy for influencing the pace of agricultural modernization and production; and they are a potentially important symptom of failings in the agricultural sector. These various roles of price interact upon each other and therefore require simultaneous consideration. Agricultural prices also interact with other factors influencing capital function, capital transfers, consumer prices and agricultural development policy.

   The principal investigator and his research staff, having wide experience on agricultural development

problems abroad, proposed to determine the instrumentality of the influence of agricultural prices and price policy on the relative rates, direction and level of agricultural development.

II. Evaluative Information

6. Description of Project:

a. The proposed research has three broad areas of inquiry: (1) the role of prices in intersectoral capital and income transfers; (2) the effect of price relationships on agricultural production and marketings; and (3) the factors affecting urban food prices. Because of close inter-relationships, work will proceed simultaneously on all three parts.

b. Two specific phases will be initiated in each of the three parts of the study:

Part I - The Role of Prices

Phase A. An empirical study of the domestic terms of trade for agricultural commodities. (India)

Phase B. The development of an inter-sectoral model of economic development which will facilitate analysis of the role of agricultural prices in intersectoral capital and income transfers. (Taiwan)

Part II - The Effect of Prices on Production

Phase A. A detailed analysis of the aggregate demand schedule for fertilizer. (India)

Phase B. A detailed analysis of the aggregate demand schedule for water. (India)

Both will consider:

1. Variability of physical response relationships,
2. Interaction of physical response with technology,
3. Influence of price on the economics of water/fertilizer use with particular assumptions about physical response, and
4. Inhibitors to the effect of price.

This part of the study will be extended to Taiwan, Pakistan, the Philippines and Mexico and possibly to Korea in later years. Preliminary exploration of public policy in regard to agricultural prices will be made in Mexico during the first year.

Part III - Factors Affecting Urban Prices

Phase A. A milk marketing study (India) to determine:

1. Size of margins in milk marketing
2. Impact of these margins on production volume and geographic pattern of production, and
3. Effect of changes in technology on marketing and production.

Phase B. (Tentative) A rice marketing study to consider the same factors as above. (Thailand)

c. Further discussion with the principal investigator indicates the possibility of early consideration of extension of the project to Korea (discussion requested by USOM/Korea/RDD 7/26/66). Another extension being considered is to investigate the marketing and pricing of rice in Thailand (interest indicated by FE/ID and Mission Director, Thailand).

7. Contractor Performance:

Cornell University has specialized in research and training for economic and social development overseas. It has fully adequate resources in terms of knowledge, experience in overseas research and long-range interest in agricultural development in less developed countries.

Dr. John W. Mellor, the Project Director, is a Professor in the Department of Agricultural Economics and Department of Asian Studies. He has spent 18 months in India conducting research, and has many publications in agricultural prices and related fields. The two senior investigators, Dr. Donald K. Freebairn, Associate Professor, and Dr. Thomas T. Poleman, Assistant Professor, have had research experience overseas.

Since the contract was signed (June 30, 1966) certain changes in research procedure and scope of work were requested by Dr. Mellor. These have been worked out in detail with the monitor, and an amendment of the contract was submitted to the contract office (MR/CSD) August 30, 1966. The Contractor expects to use graduate students (now at Cornell) in the U.S. and abroad in conducting the research.

A project advisory committee will be appointed consisting of (1) Bruce F. Johnston, Stanford University, (2) Vernon Ruttan, University of Minnesota, (3) Walter Falcon, Harvard University, (4) Clifton Whartan, Agricultural Department Council, (5) Robert Stevens, Michigan State University, (6) Martin Abel and Raymond Christensen, ERS, USDA, and (7) Douglas Caton, TCR/ARDS, AID/W.

The principal investigator has agreed to go on the research full time, rather than half time as originally proposed.

8. Evaluation of Results:

The principal investigator's concern with proper design and organization of the research, and his concern with writing a revised scope of work as experience is gained indicates fruitful results over the duration of the project, and important additions to knowledge on the role and function of price incentives.

9. Plans for the Future:

A.I.D. is fully cognizant of the important role which graduate training is to play in the project and the consequent necessity of maintaining substantial flexibility both in the delineation of sub-projects and the inclusion of particular countries in the work. This feature will be given additional recognition in the contract. Further specification will be given the project by emphasizing that "Study will be made of the relative role of agricultural prices and price policy on the incentives and actions of farmers to produce and market agricultural commodities."

It is expected that the principal investigator will be well organized to move on the contract by October 1, possibly earlier. The first quarterly report (due October 1) will detail the plan of work for the first year. The scope and design of research of the entire project will be evaluated by the Contractor, TCR/ARDS, and the project advisory committee at the end of the first year, revisions made as agreed upon, and a plan of work developed for the remainder of the research. Extension of the research to other subjects and/or countries will also be considered at the same time.

The principal investigator appreciates that the study must be as carefully and precisely done as possible because knowledge of the role of prices and the forces underlying them is sketchy in the less developed countries.

It should be emphasized that this type of study imposes stringent methodological requirements with respect to the reliability of the data and the development of specific price analysis models.

Signed: _____
Monitor

Approved: _____
Director, TCR/ARDS

DRAFT

Research Program

Date: 9/15/66

Current Monitor: Mr. John R. Wilson
TCR/ ARDS
~~or RC/~~

PROGRESS REPORT

Project Title: Technical and Economic Factors Associated with Establishment of a Seed Industry in the Less Developed Countries

Contractor (or U.S. Agency): Mississippi Seed Technology Laboratory, Mississippi State University

Origin : Solicited [ ] Unsolicited [x]

Status : Active [x] Completed [ ]

Duration: Date of initiation June 27, 1966

Date of completion (Actual or estimated) March 31, 1968 - (Final Report and Handbook due)

Cost : Total (Actual or estimated) $50,000

Obligations (through 6/30/66) $50,000

Project Summary

Objective: The objective of this project is to determine the conditions necessary to promote the development of a private sector seed industry capable of supplying the required amounts of improved seed by 1980, and to suggest the changes in existing laws, rules, regulations, and methods of operation needed to achieve this goal in the less developed countries. The contractor will prepare a handbook presenting the above findings to be used as a guide to seed production improvement to Seed Companies, USAID Missions and the less developed countries.

Description: The past, present, and expected involvement of the American seed industry in seed production activities in the LDCs will be determined by means of surveys and interviews. Emphasis will be placed on the nature of previous experiences; technical, economic, and political problems encountered, details of successes and failures in overseas operations; present policies and philosophies regarding overseas operations; current and future plans for overseas operations; and changes needed in the LDCs to promote private sector seed production.

AID Missions, the USDA, the Rockefeller and Ford Foundations, FAO, private seed companies, seed officials of the LDCs, and others will be questioned as to the present status of seed research, production, regulation, and distribution programs in the LDCs; problems of the private sector seed producers; recommended solutions of private seed producer problems; and the future requirements for seed.

UNCLASSIFIED

Draft
9/14/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Technical and Economic Factors Associated with Establishment of a Seed Industry in the Less Developed Countries.

2. Contractor: Mississippi Seed Technology Laboratory, Mississippi State University, Contract No. AID/csd-1203.

   Principal Investigator: Dr. James C. DeLouche, Director of Laboratory.

3. Date of Signing Contract: June 27, 1966.

   Funding: FY 1966 - $50,000 (to completion)

4. Project Monitor:

   John R. Wilson, TCR/ARDS.

5. Origin of the Project:

   An unsolicited proposal "Current and Probable Contributions of the Seed Industries of Developed Countries to Agricultural Development in the Under-developed Countries" was submitted by the Laboratory which was reviewed by TCR/ARDS, the Regional Bureaus and others. The proposal was redrafted in light of the comments made by the reviewers and re-submitted under the title shown in 1. above.

II. Evaluative Information

6. Description of the Project:

a. The objective of this project is to determine the conditions necessary to promote the development of a private sector seed industry capable of supplying the required amounts of improved seed by 1980, and to suggest the changes in existing laws, rules, regulations, and methods of operation needed to achieve this goal in the less developed countries.

The past, present, and expected involvement of the American seed industry in seed production activities in the less developed countries will be determined by means of surveys and interviews. Emphasis will be placed on the nature of previous experiences; technical, economic, and political problems encountered, details of successes and failures in overseas operations; present policies and philosophies regarding overseas operations; current and future plans for overseas operations; and changes needed in the less developed countries to promote private sector seed production.

A.I.D. Missions, the USDA, The Rockefeller and Ford Foundations, FAO, private seed companies, seed officials of the less developed countries, and others will be questioned as to the present status of seed research, production, regulation, and distribution programs in the less developed countries; problems of the private sector seed producers; recommended solutions of private seed producer problems; and the future requirements for seed. They will be asked to comment specifically on current seed production plans, programs designed to promote the growth of a seed industry, barriers to growth and to American participation in local seed production activities, and to make suggestions as to how private sector seed production can be stimulated.

Six to ten representative countries (selected by A.I.D./W) will be visited and analyzed for political, economic, and technological factors limiting and/or promoting the development of a private seed industry.

All data, concepts, recommendations, and other information developed in the study will be analyzed with emphasis on the technical, economic, and political factors affecting the development of a private seed industry by local interests, U.S. seed companies, or the two acting together.

A report of the results of the survey along with specific recommendation for eliminating barriers to the establishment of private seed industry or for minimizing their effects will be prepared in the form of a handbook for use by A.I.D./W, the US AIDs and the less developed countries. This handbook will attempt to establish and explain the requirements for the development of a seed industry and the means for satisfying these requirements. It may be issued later as a section of a textbook on seed breeding, research, production, and distribution in the less developed countries.

The contractor will set up an advisory council of five to eight members consisting of representatives of interested organizations such as the American Seed Trade Association, the American Society of Agronomy, the USDA/FAS, FAO, the Rockefeller and Ford Foundations and American universities with overseas contracts in related fields.

Below is the detailed Statement of Work for this project as it appears in the contract:

"Article I - Statement of Work

"For a period as hereinafter set forth in the Schedule, the contractor shall make available and employ its research and development facilities and personnel at the level of effort hereinafter set forth and shall perform research directed toward identifying the technical, economic, political, and other factors and conditions which hinder or promote the development of a private seed industry in the less developed countries.

"The scope of work shall include:

A. Using the contractor's best efforts to achieve the following specific objectives:

(1) To determine the economic, technical and political conditions necessary for the growth of private seed industries in the LDCs.

(2) To determine the actions and conditions which have fostered the development of seed industries by local private interests, U.S. Seed Companies or both acting cooperatively in the less developed countries.

(3) To discover the barriers to private participation in the local seed industries now existing.

(4) To establish the nature of the changes needed in existing technical, economic and political situations in order to promote the growth of a private seed industry.

(5) To report the results of this research in the form of a handbook that can be used as a guide to creating the conditions necessary for the development of private seed industries by US AIDs, officials of the less developed countries, and seed companies so that the farmers can be assured of adequate quantities of the best possible seed at reasonable prices.

B. The activities described below in order to achieve the objectives. The contractor will:

(1) Contact American seed firms and trade representatives to determine the past, present, and expected future involvement of the American seed industry in seed production and marketing in the LDCs by means of surveys, questionnaires and interviews. Emphasis will be placed on the nature of previous experiences; the technical, economic and political problems encountered; details of successes and failures in overseas operations; current and future plans for overseas expansion; and changes needed in the less developed countries to promote private sector seed production whether American seed company supported or indigenous.

(2) A.I.D. Missions, the USDA, the Rockefeller and Ford Foundations, FAO, private seed companies, seed officials of the less developed countries, and others will be questioned as to the present status of seed research, production, regulation, and distribution programs in the less developed countries; problems of the private sector seed producers; recommended solutions to private seed producer problems; and the future requirements for seed. They will be asked to comment specifically on current seed production plans, programs designed to promote the growth of a seed industry, barriers to growth and to American participation in local seed production activities, and to make suggestions as to how private sector seed production can be stimulated.

(3) Pertinent country seed publications, copies of seed laws, rules and regulations, seed production statistics and other seed information will be secured from several countries of each region. Six to ten countries (selected by AID/W

in consultation with the contractor) will be studied in depth with contractor personnel visiting each to conduct interviews with appropriate country officials, the US AIDs and others and to briefly survey the seed production situation and the political, economic and technical factors affecting it.

(4) Companies indicating past or current overseas experience will be interviewed in depth as to the difficulties encountered, how they were surmounted or circumvented, what situations presented insurmountable difficulties, what encouragement did they receive and from whom and any other information that would be of value in explaining individual country and company successes and failures.

(5) A few countries which have reported in the survey as being especially successful in promoting a private seed industry and a few where the opposite condition prevails will be studied in depth to determine the factors influencing these successes and failures and to gain an insight as to possible solutions to the problem of involving private industry in seed production in the LDCs.

(6) Six to ten representative countries (selected by AID/W) will be visited and analyzed for political, economic, and technological factors limiting and/or promoting the development of a private seed industry.

(7) A report of the results of the survey along with specific recommendations for eliminating barriers to the establishment of private seed

industry or for minimizing their effects will be prepared in the form of a handbook for use by AID/W, the US AIDs and the less developed countries. This handbook will attempt to establish and explain the technical, economic, and political conditions necessary for the development of a seed industry and the means for satisfying these requirements. It may be issued later as a section of a textbook on seed breeding, research, production, and distribution in the less developed countries.

(8) The contractor, with the approval of AID/W, may employ consultants to assist with the U.S. phases of the program, interviewing American seed companies, etc., but must use regular staff members for the less developed country interviews and surveys.

(9) The contractor will set up an advisory council of five to eight members consisting of representatives of interested organizations such as the American Seed Trade Association, the American Society of Agronomy, the USDA/FAS. FAO, the Rockefeller and Ford Foundations, and American Universities with overseas contracts in related fields. The council is to meet twice a year to provide guidance, and to review the work done. The cost of travel and per diem may be paid by the contractor for not more than five (5) people for two (2) days each two times a year."

b. The Contractor has started work on the project by hiring two well-qualified consultants who have started interviewing U.S. Seed Companies on their overseas experiences. Questionnaires are now being prepared on the basis of these interviews which will be sent to U.S. Seed Companies, USAID Missions, selected less developed countries, seed associations and others.

7. Contractor Performance:

The Contractor started work on this project as soon as the contract was signed. The people employed are highly qualified and very interested in the job since all of them have been involved in the seed industry during most of their lifetimes.

8. Evaluation of Results:

There can be no evaluation of results on a project of this kind until the final report is completed. However, considering the capability of the people working on this contract, and their wide range of experience, both in the U.S. and overseas, a highly useful report can be expected.

9. Plans for the Future:

As the interviews are conducted and questionnaires are returned, the Seed Technology Laboratory will tabulate the replies and furnish AID/W with reports on their findings. These in turn will be made available to the Missions on a continuing basis. When the final report and the handbook are completed, they will be sent to all Missions for distribution in their host countries, to educational and research institutions in the U.S. and abroad and to cooperating companies and individuals. In addition the handbook will be made available to seed associations and others interested in seed development and production in the less developed countries.

Signed: _____
Monitor

Approved: _____
Director, TCR/ARDS

DRAFT

Research Program

Date: September 14, 1966

Current Monitor: John R. Wilson
TCR/ARDS
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PROGRESS REPORT

Project Title: Control of Weeds in the Less Developed Countries.

Contractor (or U.S. Agency): Oregon State University

Origin : Solicited [ ] Unsolicited [XX]

Status : Active [XX] Completed [ ]

Duration: Date of initiation June 30, 1966

Date of completion (Actual or estimated) June 30, 1969 (extension is expected to be required to June 30, 1971)

Cost : Total (Actual or estimated) $957,232

Obligations (through 6/30/66) $478,415

Project Summary

Objective: This project is designed to find effective, economical methods for controlling weeds suited to the ecological and farming conditions found in the less developed countries. As the new weed control methods are adopted by farmers, millions of acres now out of production because of weeds can be brought back into production, and millions of acres of cultivated crop land can be made more productive.

Description: The contractor will station up to four people in Latin America, one each in four selected laboratories to work in the different regions guiding and assisting country weed research and weed control programs. In later stages, the project will be expanded to the other regions of the world. The contractor has started a review of the literature on weed control, and plans to visit selected countries during October or November, 1966, to make contact with the Missions, American universities working in Latin America, the host countries, and the institutions charged with weed research and/or weed control programs. The research will be conducted in local institutions to develop weed control methods adapted to local conditions and to train local personnel in conducting this type of research on a regional basis.

DRAFT
9/14/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Control of Weeds in the Less Developed Countries.

2. Contractor: Oregon State University, Contract No. AID/csd-1442.

   Principal Investigators: Dr. William Furtick, Professor of Agronomy, and Dr. Arnold Appleby, Assistant Professor of Agronomy.

3. a. Date of Signing Contract: June 30, 1966.

   b. Funding: (Five year project)

   FY 1966 - $478,415 (For three years)
   Future - $448,761 (Last two years - Estimated)
   Total - $927,176

4. Project Monitor: John R. Wilson, TCR/ARDS

5. Origin of Project:

   The original proposal suggested a combined research and training activity at the Oregon State campus and at certain selected points and on a limited number of problems in Latin America, primarily in Chile. After review in TCR/ARDS, the Regional Bureaus, and by USAIDs in Latin America, the proposal was made more strictly a research project, its area of geographic application and problem situation was broadened, and whereas, an element of training was retained this is to be done within the research context in the country.

   A liaison was also established with the North Carolina soils research project on mutually supporting aspects of research and methodology.

II. Evaluative Information

6. Description of the Project:

   a. There is a need for simple, cheap, and effective methods for controlling weeds in the less developed countries that can be used by the farmer to increase crop production. Weed control has not been regarded as a serious problem in most less developed

countries except for a few isolated instances such as the encroachment of poisonous weeds and unpalatable grasses into the pampas of Argentina and water hyacinth into the tropical and semi-tropical wet land rice areas. But, as new areas are brought under irrigation, as more fertilizers are used, as new crops and varieties are introduced, and as the area of cultivated land available per capita becomes smaller, it has come to be realized that the farmer cannot control the weeds in his fields, range lands, or waterways to the extent necessary to secure the benefits of this new technology. For example, the new short statured high yielding wheat and rice varieties require almost perfect weed control in order to make use of the potential bred into them and to pay for the extra inputs used, such as fertilizer, water, and better land preparation. The agronomists in the less developed countries, in the past, have concentrated their attention on crop yields, just as did the agronomists in the U.S. prior to World War II, assuming that the farmers would control the weeds themselves. When it was seen that the new technology being introduced often increased the weed problem beyond the ability of the farmer to control it, methods found to be effective in the more developed areas were tried by the few research men available but were largely discarded because of cost, ineffectiveness, or the level of skill required. This project is designed to find effective, economical methods for controlling weeds suited to the ecological and farming conditions found in the less developed countries. As the new weed control methods are adopted by farmers, millions of acres now out of production because of weeds can be brought back into production, and millions of acres of cultivated crop land can be made to produce at least 20% more than it now does.

Below are the objectives and scope of work as they appear in the contract negotiated with Oregon State University:

"ARTICLE I - STATEMENT OF WORK

"For a period as hereinafter set forth in the Schedule, the Contractor shall make available and employ its research and development facilities at the level of effort hereinafter set forth, and shall perform a research and development program directed toward the control of weeds in the less developed countries (LDCs). The scope of work shall include:

"A. Objectives

"The research will (1) identify the nature of the weed problems of the LDCs for each major ecological condition;

(2) test known methods of weed control for their effectiveness by type of weed and ecological condition; (3) develop improved or new methods and adaptions of existing weed control methods for each condition and cropping pattern; (4) determine the economic feasibility of each of the weed control methods and cropping systems at the farm level; (5) train local technicians in weed research and demonstration techniques; (6) increase the weed research capability of local institutions in the LDCs; and (7) assist the host countries in obtaining effective weed control on farms.

"B. Duties

"1. Phase One - First Year.

"a. The Contractor will search relevant literature both in Latin America and the United States to catalogue and analyze the major problems of weed control in the less developed countries.

"b. The Contractor will make a field study in Latin American countries designated by TCR/ARDS, as stipulated under Article II herein, to identify weed problems by species, extent, distribution, existing control measures, difficulty of control, and economic importance.

"c. The Contractor will evaluate, through on site inspection, research institutions as suggested by USAIDs in the designated countries to determine adequacy of facilities, research capability of personnel, and desirability as institutions through which research can be conducted.

"d. The Contractor, TCR/ARDS, and the concerned USAID, will together select Latin American research institutions through which research work will be conducted.

"e. The Contractor will set up operational plans designed to develop and insure independent research competency and maximum effectiveness of local institutions on work initiated under this project.

"f. The Contractor will develop a detailed research program to include priorities of problems to be studied in each selected area and research institution.

"g. The research programs will be designed to test and evaluate all known practicable weed control methods against methods commonly used in each selected area comparing

effectiveness, timeliness, labor requirements, capital cost, cost of supplies and other inputs, effect on yield, effect on other farming practices, and adaptability to local conditions.

"h. The research programs will in addition be designed to evaluate the transferability of alternative methods of weed control from one area to another.

"2. Phase Two - Subsequent Years.

"a. The Contractor will staff the selected local research institution and implement the operational and research programs.

"b. The Contractor's staff members assigned to each local institution will be responsible for conducting the research work and coordinating it through the local USAID with the weed control activities of other USAID contractors, local governmental agencies, universities, research institutions, and industries in Latin America.

"c. The Contractor will be responsible for training local personnel in effective and control methods and modern research procedures and increasing the independent research capabilities of local institutions and personnel.

"d. Where present methods of weed control are inadequate or impractical, the Contractor will seek new methods through research by both the selected Latin American institutions and the Contractor's research staff at Oregon State University.

"e. The Contractor, working through the concerned USAIDs and in conjunction with cooperating governments, will seek effective means to insure adoption of weed control methods found suitable for specific areas and problems.

"f. At the end of each year during Phase two of this project, members of the Contractor's staff (including consultants) both in Latin America and Oregon approved by the Contracting Officer, may meet at a location in Latin America designated by the Contractor with the approval of TCR/ARDS and the concerned USAID to review the previous year's research and develop plans for the ensuing year."

b. An airgram has been sent to all Missions outlining the project, including the scope of work, for discussion with the host governments. Dr. Furtick has hired two men who have received their PhD's under him in weed control -- both are fluent in Spanish -- to be assigned to Latin American countries. A senior agricultural economist has been put on the staff and the literature search has started. Security clearances have been received on all employees and as soon as the replies to the above-mentioned airgram are received, Dr. Furtick, Dr. John Edwards, the Agricultural Economist, and possibly Dr. Cardenas, one of the field scientists, will go to Latin America for the field study, probably in late October or early November.

7. Contractor Performance:

The Contractor started work as soon as the contract was signed and has staffed the project with outstandingly competent personnel.

8. Evaluation of Results:

The project is developing satisfactorily.

9. Plans for the Future:

The team from Oregon State University will go to Latin America to investigate the extent of the weed problem, the types and density of the principal weeds in the differing ecological areas, the methods of control now being used, the economic components involved in weed control and the effect of weeds on food quality; and to locate institutions having the necessary interest and capability in which the later phases of the research can be conducted. The report resulting from the literature search will be circulated to all Missions, as will later reports on the new methods of weed control developed. As the research in Latin America progresses and the capability of Oregon State University for this type of research grows, the project will be extended to other regions as requested by the Missions.

Signed: _____
Monitor

Approved: _____
Director, TCR/ARDS

DRAFT

Research Program

Date: 9/12/66

~~Current~~ Monitor: TCR/ARDS

~~xxxxxxx~~

PROGRESS REPORT

Project Title: History and Current Status of Arid Lands Research in the U.S.

Contractor (or U.S. Agency): National Science Foundation

Origin : Solicited ☐ Unsolicited ☒ x

Status : Active ☐ Completed ☒ x

Duration: Date of initiation June 30, 1962

Date of completion (Actual or estimated) April 30, 1964

Cost : Total (Actual or estimated) $40,000 AID; NSF also contributed $18,6

Obligations (through 6/30/66) $40,000

Project Summary

Objective: To prepare an evaluative compilation of U.S. research on Arid Lands through 1960. The purpose was to relate the United States experience on arid lands development, indicating problems and solutions obtained, as a means of providing policy guidance on development programs for other countries. The final report was to be prepared in time to serve as the U.S. contribution to the Buenos Aires conference (UNESCO) on problems of arid lands.

Description: The Committee on Desert and Arid Zones Research of the American Association for the Advancement of Science did the overall planning and supervising of the report. Seventy-five U.S. scholars contributed to the 16 chapters and eight case studies included in the report. The report was carefully edited by an editorial board by the committee and was printed, under the title "Aridity and Man - The Challenge of the Arid Lands in the United States," as Publication No. 74, American Association for the Advancement of Science. It was printed in Spanish and English (750 copies in each language) and has been distributed throughout the world by the NSF and AID.

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DRAFT 9/9/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: History and Current Status of Arid Lands Research in the United States

2. Contractor: National Science Foundation, subcontracted through American Association for the Advancement of Science, Washington, D. C. (The Association also received a grant from the National Science Foundation under the authority of an AID/NSF Letter of Agreement, dated June 30, 1962.)

   Principal Investigator: Mr. Carl Hodge

3. a. Date of Initiation: June 30, 1962

   b. Funding: (18 months)

AID	$40,000
NSF	18,650
Total	$58,650

   c. The original contract agreement between AID and NSF was amended to provide for publication of the study results as an AAAS monograph and the sale of the monograph by AAAS according to provisional clauses regarding sponsorship credit, financing, and profits from sales.

4. Project Monitors:

   Dr. Edward C. Fei, Deputy Assistant Administrator for Research
   Mr. David Tilson, Chief, Research Division, HRSD

   Note: AAAS treated the funding as an NSF grant administered in accordance with NSF policies. NSF appointed Dr. Arthur Roe, Head, Office of International Science Activities and Robert F. Hull, Program Management Officer project monitors.

5. Origin of the Project:

   The AAAS Committee on Desert and Arid Zones Research submitted a research proposal dated March 24, 1962, entitled "Compilation of Arid Lands Research" to the National Science Foundation. The basis for this unsolicited proposal was the usefulness of such a documentation of research on problems of arid lands to the proceedings of the UNESCO Conference on arid lands development problems to be held in Latin America in 1963.

The AAAS proposal was reviewed within NSF but considering the subject and the proposed use of the documentation as an aid to developing countries, the study was jointly funded by AID and NSF.

II. Evaluative Information

6. Description of Project

a. The objective of the study was an evaluative compilation of U. S. research on arid lands through 1960. The purpose was to relate the United States experience on the arid lands development, indicating problems and solutions obtained, as a means of providing policy guidance on development programs for other countries.

b. The chapter headings of the report indicate its content and the type of coverage provided: (1) Aridity and Man: An Interpretive Summary, (2) Regional Setting, (3) Indian Adaptations to Arid Environments, (4) Historical Framework, (5) Weather, Complex Causes of Aridity, (6) Water and Its Use, (7) Minerals and Energy Sources of the Arid West, (8) Soils of the Arid West, (9) Aridity and Agriculture, (10) Role of Watersheds and Forests in the Arid West, (11) Natural Animals and Plants as Resources, (12) Human Factors in Desert Development, (13) Economic Development of Arid Regions, (14) Political and Social Institutions in Arid Regions, (15) Central Review of Man's History in Arid Regions, (16) Challenge of the Future.

To further the understanding of current trends and future needs, eight case histories were included: (1) Tuscon: A Problem in Uses of Water, (2) Upper Rio Grande: Embattled River, (3) Erubudo: Rise and Decline of a Program, (4) Rio Puerto: Abused Basin, (5) Los Angeles: Growing Pains of a Metropolis, (6) Central Valley: Water Use at its Maximum, (7) Great Plains: A Region Basically Vulnerable, (8) Sandstone Creek: How a Watershed Was Saved.

The Committee on Desert and Arid Zones Research (CODAZR) of the American Association for the Advancement of Science which was the coordinating unit in the United States for the Buenos Aires conference, also did the overall planning and supervising for the report. Carl Hodge, Editor, Arid Lands Research Newsletter, and Science Editor, The Arizona Daily Star, was selected as Editor;

and Dr. Peter C. Duisburg, Arid Lands Consultant with wide contacts with Latin American scientists interested in arid zone problems, was selected as Associate Editor of the report. An Editorial Board was elected to be directly responsible to the Committee for the compilation and writing of the report.

First the entire Committee, and then in finer detail, the Editorial Board, worked out the outline of the report, the selection of chapter headings and prospective authors and coordinated and reviewed the work.

7. Contractor Performance

Some 75 outstanding U. S. scholars are listed as authors or contributors to this report. The American Association for the Advancement of Science was so impressed with the manuscript that it was selected for publication in the prestigious AAAS monograph series. Dr. Arthur Roe, Head, Office of International Science Activities, National Science Foundation, in a letter to Dr. Fei, dated May 24, 1963, commented that "AID and NSF may both be proud of the fact that this manuscript has been selected for publication in that series."

8. Evaluation of Results

a. Major Results: The report was published under the title "Aridity and Man - The Challenge of the Arid Lands in the United States," Publication No. 74, American Association for the Advancement of Science, Washington, D. C., 1963. The Spanish title is "El Hombre Y las Tierras Aridas." It is considered to be the standard work in this area.

b. Known Uses:

- 1,500 copies of the publication (750 in English and 750 in Spanish) were distributed throughout Latin America and the United States by the National Science Foundation on the basis of a distribution plan prepared by NSF and AID.

- Of the remaining 500 copies (250 in English and 250 in Spanish), most were distributed to the USAID missions but a few are still available to fill requests for informational material in this area.

9. **Follow-up:**

CODAZR organized a symposium on "Arid Lands in Latin America, Their Problems and Approaches Toward Their Solution" for the 1964 annual meeting of the AAAS to acquaint researchers and other interested parties in the United States with what is being done and what needs to be done in the general field of arid lands research in Latin America.

Signed: _____
Monitor

Approved: _____
Director, TCR/ARDS

DRAFT

Research Program

Date: September 12, 1966

~~Current~~ Monitor: Mr. Jack Oppenheimer*
TCR/ _____
or PC/ _____

PROGRESS REPORT

Project Title: Land Tenure and Reform in Puerto Rico

Contractor (or U.S. Agency): Economic Research Service, USDA

Origin : Solicited [x] Unsolicited [ ]

Status : Active [ ] Completed [x]

Duration: Date of initiation January 1, 1962

Date of completion (Actual or estimated) June 30, 1964 (Final reports now under review for publication)

Cost : Total (Actual or estimated) $60,000

Obligations (through 6/30/66) $60,000

Project Summary

Objective: To study the achievements of the land reform program that had been initiated under the "Land Law of 1941." A central objective was to analyze the effect of the land tenure reform measures on the productivity of agriculture and general economic development.

Description: Under the "Organic Law of 1899" corporate land holdings were limited to 500 acres, and this provision was made effective by the Law of 1941. A Puerto Rico Land Authority was established to manage land acquired under a system of Proportional Profit Farms with some of the lands distributed as family farms.

Although several of the profit sharing farms have realized a net profit, on balance total losses have been substantial; nevertheless, the losses incurred or subsidies were more than offset by the increased volume of sugar produced for export, which has played a leading role in the postwar development of the economy.

* The project was completed except for the report before Mr. Oppenheimer's departure.

DRAFT 9/10/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Land Tenure and Reform in Puerto Rico

2. Contractor: Economic Research Service, U.S. Department of Agriculture

   Principal Investigators: Dr. Howard L. Hill, Agricultural Economist, and Dr. David Haddock, Agricultural Experiment Station, University of Puerto Rico.

3. a. Date of Signing PASA: January 1, 1962

   b. Funding: ($2\frac{1}{2}$ years)

FY 1962	15,000
FY 1963	22,500
FY 1964	22,500

4. Project Monitors:

   Mr. Jack C. Oppenheimer

5. Origin of Project: The USDA and the Agricultural Experiment Station, University of Puerto Rico initiated this study. In correspondence and discussions, dating from October 19, 1961, between Dr. Kenneth Bachman, ERS/USDA, and Mr. David Mayer and other A.I.D. officials it was decided to expand its scope of work.

Evaluative Information

6. Description of Project

   a. The objective of this project was to study the land reform program that had been initiated under the "Land Law of 1941" in Puerto Rico to evaluate the concepts and techniques developed and the experience gained while acquiring, distributing and/or managing the land affected by this legislation. Project personnel were to identify and evaluate land tenure problems in Puerto Rico; analyze the effect of land tenure reform measures on the productivity of agriculture, the levels of income of rural people, and the patterns of land use; and to evaluate the program in terms of its relevance for current and future land policy.

b. The Economic Research Service assigned Mr. John Stahl to work full time on the project in Puerto Rico, and also contributed $15,000 annually to the research. The Puerto Rico Agricultural Experiment Station provided $13,000 annually in the form of staff, office space, and data processing facilities.

Production statistics from the Statistical Yearbook, reports of the Land Authority, and the land laws were the principal sources of data for the study.

The investigators directed their attention to the study of the enforcement of the "Organic Law" of 1899 which limited corporate land holdings to 500 acres. The land illegally held was acquired by the Commonwealth and disposed of according to the Land Law of 1941. Lands in sugar plantations were managed by the Puerto Rico Land Authority which distributed profits to its farm workers and managers in proportion to regular union scale wages paid during the year (Proportional Profit Farms). Other lands were divided into family-size and subsistence units.

7. Contractor Performance

While the USDA/ERS assigned competent people to this project the work has not been completed as scheduled. The explanation offered for the two-year delay in delivering the reports is that the investigators have been working on other research projects or have accepted employment outside the USDA and that clearance of the reports in Puerto Rico and the USDA has been slow.

8. Evaluation of Results

a. Major Results

One publication, "An Application of a Klein Growth Model to Puerto Rico, 1947-61" by John Stahl, in Economic Development and Cultural Change, Vol. XIII, No. 4, July 1965, describes the phenomenal growth of the Puerto Rican economy, including changes in agriculture.

A paper, "The Puerto Rican Land Law of 1941" was prepared for the periodic inquiry of the United Nations into progress in land reform.

The following generalizations taken from project materials are significant:

(1) Agrarian reform was a necessary, but not sufficient condition, for the industrialization program in Puerto Rico.

(2) Proportional profit farms have had a depressing effect on the sugar industry of Puerto Rico.

(3) The sugar industry has played a leading role in the post-war development of the economy.

(4) The aggregado resettlement program (under Title V of the Land Law) has perpetuated rural poverty.

(5) Creating fluid capital through compensation for expropriated lands provided a stimulant to diversified development.

It is expected that the three reports due from the project will furnish additional useful results for land reform policy in Latin America.

b. Professional Evaluation of Results

Cited publications (8.a. above) are of high professional quality. There is no reason to believe that remaining reports (9. below) will be less so.

c. Known Uses of Results

Indeterminate

9. Plans for the Future

Dr. Hill stated on August 10, 1966, that three manuscripts, including the final report on the project, await clearance of USDA and Puerto Rican officials, before transmittal to A.I.D. Two of the reports deal with the changing patterns of farming, productivity, costs, and income following land redistribution.

As soon as the reports are received, they will be evaluated by TCR/ARDS and the agricultural sections of the Regional Bureaus. Following publication, they will then be sent to USAID missions, institutions and individuals as is deemed appropriate at that time for their information and guidance.

Signed _____
Monitor

Approved _____
Director, TCR/ARDS

RTMcMillan/JRWilson/DDCaton:TCR/ARDS:9/10/66

DRAFT

Research Program

Date: September 12, 1966

~~Bureau~~ Monitor: TCR/ARDS

~~Author~~:

PROGRESS REPORT

Project Title: Study Conference on Means to Increase Agricultural Productivity in the Underdeveloped Countries

Contractor (or U.S. Agency): Center for International Studies, Mass. Inst. of Tech.

Origin : Solicited [x] Unsolicited [ ]

Status : Active [ ] Completed [x]

Duration: Date of initiation May 29, 1964

Date of completion (Actual or estimated) February 1, 1965

Cost : Total (Actual ~~or estimated~~) $146,200

Obligations (through 6/30/66) $146,200

Project Summary

Objective: To bring together leading world authorities on agricultural development to exchange ideas and to: (1) critically examine alternative solutions to the problems of increasing agricultural production in the less developed countries; (2) identify and define key obstacles to increasing productivity; (3) evolve research that would indicate methods for overcoming these obstacles; and (4) recommend measures to be taken.

Description: The contractor planned and conducted an intensive, six week seminar participated in by 44 eminent, natural, life and social scientists from the U.S. university community, the federal and state governments, international organizations, the Foundations, and several foreign countries. A report, "Policies for Promoting Agricultural Development," was prepared by the members of the seminar and presented to the Administrator in a high level staff meeting. It has since been distributed to all missions and through them to their host countries. It is now being used as a standard reference on agricultural development by the universities and the Peace Corps.

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DRAFT

Research Program

Date: September 12, 1966

~~Research~~ Monitor: TCR/ARDS

~~xxxxxx~~

PROGRESS REPORT

Project Title: Study Conference on Means to Increase Agricultural Productivity in the Underdeveloped Countries

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DRAFT
9/8/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: Study Conference on Means to Increase Agricultural Productivity in the Underdeveloped Countries

2. Contractor: Center for International Studies, Massachusetts Institute of Technology - Contract No. AID/csd-452.

   Principal Investigator: Dr. Max Millikan

3. a. Date of Signing Contract: May 29, 1964.

   b. Funding: Obligated $250,000

   Expended $146,200

4. Project Monitor:

   Dr. Frank W. Parker, HRSD/AGRIC (now TCR/ARDS)

5. Origin of the Project: The RAC, October 1963, strongly recommended the study conference which had been proposed originally by Dr. J. Wyle. Dr. Millikan of M.I.T. (a member of the RAC) was asked to submit a proposal.

II. Evaluative Information

6. Description of Project

   a. The conference was intended to bring together the leading world authorities on the development of agriculture to exchange ideas and to establish, if possible, universal principles leading to the improvement of agriculture in the LDCs. The group was to: (1) critically examine possible alternative solutions to the problem of how to increase agricultural productivity in the less developed countries; (2) identify and define the key obstacles to increasing productivity; (3) evolve research designs that would indicate methods for overcoming these obstacles and (4) recommend measures to be taken, where it was clear that enough knowledge was already available to deal with some problems.

   b. The contractor implemented this project by planning and conducting a six-week intensive study conference participated in by 44 eminent natural, life, and social scientists (list attached) under the leadership of Dr. Millikan, at Dedham, Massachusetts during July and August, 1964. The participants were drawn from

the U. S. University community, the Federal and State governments, International organizations, Foundations, and foreign countries and from many different disciplines. In addition to the full-time participants, the contractor arranged for several consultants to attend the conference for brief periods and A.I.D. personnel participated whenever possible.

The conference program was divided into three sections. During the first two weeks, mutual briefing sessions were held with each participant describing the contribution he felt his particular discipline could make to solving problems associated with increasing agricultural productivity. For the second period of two weeks, the participants were divided into four working groups, each concerned with a different type of agricultural ecology. Each group included a mix of disciplines. For the last two weeks, participants were again reorganized into four sub-groups to study the agricultural problem on a functional rather than a geographical basis.

The draft conference report was prepared mainly by the sub-groups and was revised and edited by Dr. Millikan, Conference Chairman, and David Hapgood, Editor. It was then submitted to the participants and revised in the light of their comments.

7. Contractor Performance

The conference was conducted without a rigid agenda and in a very informal atmosphere but, at the same time, the participants were able to concentrate their attention fully on the problems of agriculture. As Dr. Millikan has stated, the intellectual problems encountered in the discussions provided a useful clue to the practical difficulties of agricultural development, i.e., complex problems often require equally complex solutions. However, the contractor's report as presented to A.I.D. is one of the clearest and most comprehensive statements ever made on the problems of agricultural development and their solution.

8. Evaluation of Results

a. Major Results:

The report, entitled "Policies for Promoting Agricultural Development", describes the problems associated with increasing agricultural productivity: the nature of the major inputs -- physical, economic, educational -- required to increase productivity; the research needed to provide the necessary knowledge base; how available resources can be organized for maximum efficiency; and the agricultural problems of the four ecological regions of the world and policies needed to solve them.

b. Professional Evaluation of Results:

The analysis is in non-technical language which administrators and laymen as well as scientists can understand. The Table, Classification of Factors Affecting Agricultural Development (Table I), is an excellent summary of the problems facing agriculture. The most obvious limitation in the report, perhaps intentional, was the casual reference to the effects or implications of rapid population growth upon agricultural productivity and development. It is noteworthy that no demographer was among the participants.

c. Known Uses of Results:

The report was presented to A.I.D. by Dr. Millikan at an Executive Staff Advisory Committee Meeting at which time he pointed out the highlights of the conference. The Administrator requested that it be distributed to all USAIDs and that Mission Directors, Agricultural Officers and Program Officers give it serious attention. The report has been reprinted and over 1,000 copies have been distributed by A.I.D. It has become a standard reference on agricultural and economic development, thus reflecting credit to M.I.T., Dr. Millikan, the participants, and A.I.D., and many parts of it will continue to be useful for several years to come.

8. Plans for the Future

The project is completed. The report has been presented to all USAIDs and is being used by them, and by AID/W, as a guide and reference in planning programs designed to increase agricultural productivity. This excellent reference is still in demand by the Missions and is being requested for use in participant training programs.

Signed _____
Monitor

Approved _____
Director, TCR/ARDS

APPENDIX I

PARTICIPANTS IN THE CONFERENCE

KENNETH L. BACHMAN	United States Department of Agriculture
MILTON L. BARNETT	The Agricultural Development Council, Inc.
HUGH L. COOK	The University of Wisconsin
RALPH W. CUMMINGS	The Rockefeller Foundation
EGBERT DE VRIES	Institute of Social Studies, The Hague
RAYMOND EWELL	State University of New York at Buffalo
GEORGE M. FOSTER	University of California, Berkeley
FREDERICK W. FREY	Massachusetts Institute of Technology
ARTHUR GAITSKELL	
ALEXANDER GROBMAN	Ministry of Agriculture of Peru
ROBERT M. HAGAN	University of California, Davis
DAVID HAPGOOD	
ALLAN R. HOLMBERG	Cornell University
W. DAVID HOPPER	The Ford Foundation
VERNON C. JOHNSON	Department of State, Agency for International Development
DON KANEL	The University of Wisconsin
AKHTER HAMMEED KHAN	Pakistan Academy for Rural Development
RAJ KRISHNA	University of Delhi
WOLF I. LADEJINSKY	
STEPHEN A. MARGLIN	Massachusetts Institute of Technology
LEE R. MARTIN	The University of Michigan
JOSE D. MARULL	Instituto Interamericano de Ciencias Agricolas de la OEA
EILIF V. MILLER	Department of State, Agency for International Development
MAX F. MILLIKAN, Chairman	Massachusetts Institute of Technology
JOHN D. MONTGOMERY	Harvard University
ARTHUR T. MOSHER	The Agricultural Development Council, Inc.
WILL M. MYERS	University of Minnesota
ERNEST E. NEAL	Department of State, Agency for International Development
WILLIAM H. NICHOLLS	Vanderbilt University
KARL D. OLSEN	Food and Agriculture Organization of the United Nations
FRANK W. PARKER	Department of State, Agency for International Development
ROGER REVELLE	Harvard University
RALPH W. RICHARDSON, Jr.	The Rockefeller Foundation
EVERETT M. ROGERS	Michigan State University
PAUL N. ROSENSTEIN-RODAN	Massachusetts Institute of Technology
M. B. RUSSELL	University of Illinois
ORLIN J. SCOVILLE	Department of State, Agency for International Development
ALLEN L. SPAFFORD	International Minerals & Chemical Corporation

GEORGE C. SWEENEY, Jr.	Arthur D. Little, Inc.
D. WOODS THOMAS	Purdue University
YIEN-SI TSIANG	J oint Commission on Rural Reconstruction
M. C. VERGHESE	Centre for Industrial Development, United Nations
CLIFTON R. WHARTON, Jr.	The Agricultural Development Council, Inc.
WALTER W. WILCOX	The Library of Congress

DRAFT

Research Program

Date: September 12, 1966

Current Monitor: Dr. Robert T. McMillan
TCR/ARDS
~~AID~~

PROGRESS REPORT

Project Title: The Administration of Technical Assistance Programs with Special Reference to Technical Assistance in Agriculture

Contractor (or U.S. Agency): Syracuse University, Contract No. AID/csd-289

Origin : Solicited ☐ Unsolicited ☒

Status : Active ☐ Completed ☒ (Follow-up work necessary for completion of final report)

Duration: Date of initiation June 26, 1963

Date of completion (Actual or estimated) June 25, 1966

Cost : Total (Actual or estimated) $355,475 (of which $33,000 retained pending submission of final report)

Obligations (through 6/30/66) $355,475

Project Summary

Objective: To identify administrative problems and to develop recommendations for improvements in administrative effectiveness of the programming of U.S. assistance efforts.

Description: Basically, the research was to isolate and study strategic relationships on how to conceive and manage technical assistance abroad, and on how to backstop the country assistance programs in an effective way. This was a formidable task. Questionnaires and field interviews were used in eight countries.

A total of 26 staff reports have been prepared. Some of them are not in a useable form; the task was very difficult and involved a learning process. The voluminous reports and findings will require careful editing and summarizing to obtain a concise and useful document.

DRAFT 9/10/66

RESEARCH PROJECT PROGRESS REPORT

I. Descriptive Information

1. Name of Project: The Administration of Technical Assistance Programs, with Special Reference to Technical Assistance in Agriculture.

2. Contractor: Syracuse University, Contract No. AID/csd-289.

   Principal Investigator: Dr. John Lindeman, Maxwell Graduate School of Citizenship and Public Affairs.

3. a. Date of Signing Contract: June 26, 1963

   b. Funding:

   FY 1964 - $355,475 (funded to June 1966)
   Note: $33,000 has been retained by AID pending submission of final report.

   c. Four amendments, dated May 14, 1964, November 30, 1964, September 1, 1965, and January 31, 1966, have been made to clarify provisions of the contract. The last amendment extended the contract termination date from January 31, 1966, to June 25, 1966.

4. Project Monitors:

   Frank W. Parker and David Mayer - June 26, 1963, to January 1966
   Robert T. McMillan - January 1966 to June 1966

5. Origin of Project:

   The research was based on concern expressed within AID, and discussed with Syracuse University, on weaknesses in the administration of technical assistance and the need for evaluation to identify administrative problems and develop possible solutions.

II. Evaluative Information

6. Description of Project:

   a. The research objective was to identify administrative problems and to develop recommendations for improvements. The underlying rationale was concern with the administrative effectiveness of the programming of the United States assistance efforts in the LDCs.

Research was conducted on:

(1) General administration of technical assistance programs:

(a) The techniques and criteria used in deciding on acceptable technical assistance programs and projects, with emphasis on their nature, scope, and structure.

(b) The project review process in the recipient countries and in the donor agencies, including the means used to coordinate projects in different substantive fields and similar projects sponsored by other agencies.

(c) The kinds of arrangements provided for institution building.

(d) Selection, recruiting, and employment conditions for technical assistance personnel, and for participants (trainees).

(2) Administration of specific technical assistance projects:

(a) Introduction of up-to-date techniques (tested seed, use of fertilizer, double-cropping, etc.).

(b) Irrigation and drainage.

(c) Research, education, and extension work.

(d) Training centers.

(e) Land tenure reform and taxation.

b. Basically, the research was to isolate and study strategic relationships on how to conceive and manage technical assistance abroad, and on how to backstop the country assistance programs in the best way possible. The types of problems being encountered, the areas of concern to be explored, and the major questions being asked were reviewed with Dr. Lindeman and the research group by AID research and administrative leaders at the inception of the study.

To obtain the descriptive and quantitative data required, both mailed questionnaires and field interviews were used. Questionnaires were sent to about 35 countries. The research field staff conducted field interviews in eight countries: Colombia, Peru, Nigeria, Kenya, Iran, Pakistan, Thailand, and the Philippines, and visited 11 other countries. Approximately 1,500 officials were interviewed in AID/W, the USAIDs, FAO, UN,

Ford and Rockefeller Foundations, and other agencies providing technical assistance. Also, staff members reviewed end-of-tour reports and other documents in AID and USAID files on technical assistance programs and projects.

All together, 25 professional staff were employed on the project.

7. Contractor Performance:

A total of 26 staff reports and working papers were prepared. Nineteen of the reports are on major aspects of technical assistance administration. These staff reports and working papers, by title, are as follows:

a. Staff Reports:

(1) "Personnel for Technical Assistance," by Robert Iversen (194 pages - mimeographed).
First draft forwarded to AID, 3/22/65.
Final paper presently being duplicated.

(2) "Headquarters'Field Relationships," by Roscoe C. Martin and Mildred Martin (approximately 225 pages - dittoed).
First draft completed.
Final paper presently being duplicated.

(3) "The Programming Process in Technical Assistance, with Concentration on Agricultural Technical Assistance," by Richard L. Duncan.
Final paper to be completed and submitted in early March 1966.

(4) "U. S. Technical Assistance in Perspective," by John Lindeman.
To be completed as an elaboration of the final report.

(5) "Joint Operations in Technical Assistance," by Robert J. Shafer and Others (89 pages - mimeographed).
Final report submitted to AID, 5/5/65.

(6) "The Organization of United Nations Technical Assistance," by John White (93 pages - mimeographed).
Submitted to AID, 3/16/65.

(7) "Technical Administration: A Problem in Management," by Sidney C. Sufrin (56 pages - multilithed).
Submitted to AID, 3/22/65.

(8) "The Magnitude and Complexity of Technical Assistance," by John Lindeman and John Kubert (118 pages - mimeographed).
Submitted to AID, 3/22/65.

(9) "Community Development and Agricultural Extension," by Manouchehr Safa-Isfahani (93 pages - dittoed).
Complete - to be forwarded to AID, 2/66.

(10) "The Revelle Report: A Case Study in the Administration of Technical Assistance," by Albert Gorvine (75 pages - multilithed).
Submitted to AID, 3/22/65.
Revision submitted to AID, 6/7/65.

(11) "The University of Nebraska Project at Ataturk University: A Case Study in the Administration of a University Technical Assistance Project," by Albert Gorvine (69 pages - dittoed).
Submitted to AID, 3/16/65.
Revision submitted to AID, 10/29/65.

(12) "The Organization, Administration, Training Programs, and Dissemination of Modern Agricultural and Community Development Technology in a Bisayan Municipality, Philippines," by Donn Hart (56 pages - mimeographed).
Submitted to AID, 3/22/65.

b. Working Papers for Circulation:

(13) "The Administration of Technical Assistance: A Comparative Study of Administration of Bilateral Technical Assistance Programs of Fifteen Foreign Countries," by John Kubert (124 pages - mimeographed).
Submitted to AID, 3/16/65.

(14) "Rural Education in Underdeveloped Countries: The Role of Technical Assistance," by Jerry Miner (22 pages - dittoed).
Submitted to AID, 2/16/65.

(15) "Analysis of Questionnaire Returns from United Nations' Resident Representatives on Technical Assistance Administration in their Countries," by John White (approximately 30 pages - typed).
Draft complete - to be forwarded to AID, 2/66.

(16) "The Administration of Technical Assistance in Czechoslovakia," by Theo Suranyi-Unger (2 pages - dittoed).
Submitted to AID, 11/22/65.

(17) "The Administration of Technical Assistance in Hungary," by Theo Suranyi-Unger (20 pages - dittoed).
Submitted to AID, 11/22/65.

(18) Bibliography: "Recent Continental European Literature on Technical Assistance (in Languages Other than English)," by Theo Suranyi-Unger.
Submitted to AID, 11/22/65.

(19) "Careers in Technical Assistance," by George Adler (23 pages - dittoed).
Submitted to AID, 1/8/65.

Working Papers for Internal Use:

(20) "The Programming of Technical Assistance in Education, with Particular Reference to Agricultural Education," by John Laska (44 pages - typed).

(21) "Technical Assistance Programs in the Field of Agricultural Education," by Garnet L. McDiarmid (140 pages - dittoed).

(22) "Technical Assistance through Private Business," by William Wasserman and William Hannum.
Draft completed.

(23) "Report on Investigation of Technical Assistance in Four Latin American Countries," by Neville Miller (33 pages - dittoed).
Complete.

(24) "The Scope of Technical Assistance in Agriculture," by George Adler (58 pages - dittoed).
Complete.

(25) "Problems of Phasing Out Technical Assistance Projects," by Raymond Lewis (20 pages - typed).
Complete.

(26) "Scientific and Technological Aid in Agriculture," by David Curzon (42 pages - dittoed).
Complete.

Syracuse put forth a great amount of effort and, except for the final report which has been delayed, accomplished a great deal. The research reports and working papers contain much useful information. However, substantial effort would be required to consolidate the findings of the 19 major research documents in the form of a working document useful to USAIDs and AID/W.

8. Evaluation of Results:

It is difficult to fully and adequately appraise the contribution of the research because it is difficult to separate theory and

philosophy from the findings and recommendations. Further, the validity of the remedies proposed for the administrative weaknesses found are in many cases difficult to ascertain. While the research has these weaknesses, and while, as indicated, much of it is not in a directly usable form, it can be said that the research, however preliminary, points the way for further research of a more definitive and directed nature. The research, in part, involved a learning process, and the completed research does provide a base that is at least directional, if not conclusive. Furthermore, Syracuse is amply aware of the deficiencies and defects in the research and the research reports.

It is relevant to say that if Syracuse, or anyone, had known in the beginning what we know now about technical assistance administration, they would have done, and could have done, a much better job. What this statement adds up to is that no one knew much about this field of investigation at the start, that we know more now, that we can provide more guidance for similar research, and that under the circumstances, Syracuse probably has done as creditable a job as possible. Lack of knowledge, causing imperfect research design; lack of control over individual researchers; and lack of unity and cohesion among the respective parts of the research are always major conditions upon the nature of the outcome and upon what should be expected. Contract research is fraught with these problems.

Nevertheless, to be useful to AID administrative operations, the voluminous reports, materials, and findings will require careful editing and summarizing to obtain a more concise working document. Dr. Lindeman has promised to give us an outline, covering the main 19 reports, indicating the portions of the reports which describe and suggest solutions to current problems. Further, he will take this requirement into account in preparing the final report, eliminating discussion of theoretical concepts, side issues, description, statistical materials, and other ideas not relevant to the questions addressed by the study.

9. Plans for the Future:

The possibility of consolidating the 19 research reports into a single document of acceptable length and stature will be explored. Dr. Lindeman will provide TCR/ARDS an outline suggesting how this might be done. He has prepared a first draft of the final report due, which sums up the research findings. Preliminary review indicated the draft needed editing, and a request was made for recommendations on how to remedy the administrative weaknesses. A second draft of the final report is expected shortly.

Signed: R. T. McMillan
Monitor

Approved: Hughes Cates
Director, TCR/ARDS

R.T.McMillan/D.D.Caton:TCR/ARDS:9/10/66

DRAFT

Research Program

Date: September 12, 1966

~~Current~~ Monitor: Herbert D. Turner
TCR/PPCS
~~PPC~~/

PROGRESS REPORT

Project Title: Mapping of Research Requirements for Food-For-Peace Program

Contractor (or U.S. Agency): Michigan State University

Origin : Solicited [x] Unsolicited [ ]

Status : Active [ ] Completed [x]

Duration: Date of initiation June 29, 1964

Date of completion (Actual or estimated) December 31, 1965

Cost : Total (Actual or estimated) $124,040

Obligations (through 6/30/66) $124,040

Project Summary

Objective: To identify and array the issues and researchable problems in the FFP program in a manner that would facilitate the objective and systematic planning and administration of a multi-disciplinary, multi-sponsored program of research.

Description: The map identifies and discusses some 28 major FFP issues and describes the important features of approximately 84 research projects. Each project description includes the research rationale, research completed or in progress; research objectives, suggested research personnel, priority and cross references. Suggested cost figures for each project are in a separate paper. The map is a carefully structured analytical and planning document, the product of intensive information collection, study and review by the multi-disciplinary MSU team, by some seventeen MSU consultants and by A.I.D., USDA and Food-for-Peace/State staffs.

PROGRESS REPORT

Descriptive Information

1. Name of Project : Mapping of Research Requirements for the Food-For-Peace Program

2. Name of Contractor: Michigan State University, East Lansing, Michigan

   Principal Investigator : Dr. Lawrence W. Witt

3. Date of Initiation: June 29, 1964

   Cost : $124,040

   Duration : 18 months. No substantive amendments. Completed on time.

4. Project Monitor : Herbert Turner responsible for all aspects of monitoring until project completion.

5. Origin of Project : TCR/ORA (Dr. Weyl, Mr. Mayer and Mr. Turner) were urged by the Food-For-Peace Office, White House, and the Office of Materials Resources, A.I.D. (AID/MR) to initiate research for the Food-For-Peace (FFP) program. The Economic Research Service of the Department of Agriculture (USDA/ERS) concurred. Because of the complexity and range of FFP activities it was decided systematically to map the research requirements prior to A.I.D. support of individual research projects. The specifications and design of the research mapping were prepared by Herbert Turner, cleared with FFP/White House, AID/MR, USDA, A.I.D.'s Office of Program Coordination (AID/PC), and endorsed by the Analytical Studies Advisory Group of A.I.D. (ASAG) in December 1963. Proposals were solicited from a carefully selected list of fourteen institutions. Additionally, notices were placed in the Commerce Business Daily. Over 100 queries and expressions of interest were received. TCR/RA evaluated, ranked and selected the two best proposals out of nine received. ASAG and RAC endorsed the ranking recommended by the staffs. Mr. Bell approved the project and the contract was negotiated.

II. Evaluative Information

6. Description of Project

The purpose of the map was to identify and array the issues and researchable problems in the FFP program in a manner that would facilitate the objective and systematic planning and

administration of a multi-disciplinary, multi-sponsored program of research. The map consists of three volumes:

Volume I - Introduction, Substantive Summary, other explanatory material

Volume II - A Program of Research in Six Sectoral Chapters:

Economic and Financial
Public Policy Issues
Social and Humanitarian
Health and Nutrition
Population and Food Supply
Program Operations

Volume III - Annotated Research Bibliography

Within the six chapters of Volume II the map identifies and discusses some 28 major FFP issues and describes the important features of approximately 84 research projects. Each project description includes the research rationale, research completed or in progress; research objectives, suggested research personnel, priority and cross references. Suggested cost figures for each project are in a separate paper. The map is a carefully structured analytical and planning document, the product of intensive information collection, study and review by the multi-disciplinary MSU team, by some 17 MSU consultants and by AID, USDA and FFP/ State staffs.

7. Contractor Performance

Contractor performance was generally good despite the complexity and intellectually demanding character of the task. Because of difficulties experienced at the outset by the contractor, the then monitor devised an analytical matrix which was adopted by the contractor and served as the conceptual and analytical framework for the entire mapping effort.

As mentioned above, the contractor operated in a close working arrangement with a team composed of representatives of FFP/ White House, USDA, AID/MR/FFP and AID/TCR. All stages of work were supervised and all drafts were exhaustively reviewed by this team of sponsors. Since this was not a research project but a preresearch analysis, an unusually close interplay of government and contractor was necessary.

8. Evaluation of Results

Description of Known Uses

A limited distribution of the map has been made within A.I.D., State, USDA, etc., to permit preliminary evaluation of the MSU recommendations and to facilitate forward research planning.

An interim review of extant FFP research, also produced by MSU under the contract, was used for A.I.D., State and USDA staff during the planning for the new Food-For-Freedom legislation.

9. Plans for Follow-Up

Staff recommendations for systematic evaluation and coordinated planning of research among the several research sponsoring agencies are being considered.

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