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211-d ANNUAL REPORT

AID/csd 2826

August 31, 1974

Title: A Grant to Increase Michigan State University's Capability in Agricultural Economics Related to the Less Developed Countries

Grantee: Department of Agricultural Economics, Michigan State University

Director: Harold M. Riley

A. Statistical Summary:

Period of Grant: June 1970 to June 1975. Amount of Grant \$625,000.
Expenditures for Report Year: \$142,322. Accumulated \$451,298.
Anticipated for Next Year: \$154,000.

B. Narrative Summary:

This grant has supported the development and maintenance of a larger and higher quality graduate training program than would otherwise have been possible. Over the past four years about one-half of a graduate student group of 100 have been individuals preparing for professional careers working on the problems of less developed countries. Through special recruiting efforts the enrollment of African students has been expanded with 18 expected to be in the program in fall 1974. The Department has been able to offer specialized development courses and related seminars to improve the quality of education for this relatively large group of development oriented students.

The 211-d supported research activities have complemented the graduate training program and the AID contract activities being carried out by the Department. Several graduate students are conducting field research in African countries and completing on-campus preparation of theses that relate to the African Rural Employment Research Network (AID/csd 3625) being directed by Dr. Eicher. There are other graduate theses which complement the Agricultural Sector Simulation Project (AID/csd 2975) that has been directed by Drs. Rossmiller and Johnson and the AID-financed agricultural marketing projects now directed by Dr. Harrison.

The grant has facilitated the further development and maintenance of a core group of 10 to 15 faculty members with substantial foreign experience and a continuing commitment to research, teaching and advisory work on LDC problems. These individuals are directing AID contract projects, teaching and supervising foreign students and actively participating in seminars and conferences where they interact with other professionals from development agencies, U. S. universities, and from LDC institutions. This faculty group has also participated extensively in long-term and short-term "talent sharing" assignments with AID in Washington and in country Missions.

During this past year the Director of the grant program has participated in a series of meetings with representatives from AID/TAB and the six universities with similar 211-d agricultural economics grants to improve communications, to explore common interests in LDC research and training activities, and to give consideration to grant renewals within the broader framework of changing AID-University relationships. A non-renewal decision by AID on the 211-d grant will reduce the size and quality of the Michigan State University graduate training program for LDC students and the core faculty will be reduced by about two full-time positions while other faculty with substantial international competence will be shifted into work on domestic problems.

C. Detailed Report

I. General Background and Purpose of the Grant

This grant was part of an interrelated set of 211-d grants involving four universities, Michigan State, Cornell, Iowa State and Minnesota. The grant program was initiated in mid-1970 with funding for a five-year period ending in June 1975. Similar grants were subsequently made to Southern University and Virginia State University.

The purpose of this set of grants was to develop and strengthen the competence of the cooperating universities in the field of agricultural economics as it relates to the problems of developing countries and to increase their ability and the ability of significant numbers of their staff to contribute to the solution of these problems.

It was generally recognized that there is a large and growing need for skilled analytical work on agricultural sector problems in the less developed countries. In these countries the process of agricultural development is associated with an increase in the market orientation of the food sector, a growing dependence on more purchased inputs, and a pressing need for public policy decisions on alternative uses of resources. Because of the relative shortage of professionals with agricultural economics training, these countries are seeking assistance in conducting analyses and developing their own analytical capacities to make policy decisions on development alternatives and the implementation of programs to achieve their development goals.

It was anticipated that the universities receiving these grants would expand and strengthen their training and research activities in order to meet some of

these needs for professional agricultural economists. AID had a particular interest in creating and maintaining a pool of faculty talent that would be available for short and long term assignments with AID or other development institutions concerned with problems in the LDC's. It was also envisioned that effective interactions would evolve among the four universities as faculty and graduate students participated in conferences, workshops and interchanged research publications.

The Michigan State University grant was made under the same general agreement that was extended to the three other universities - Cornell, Iowa State, and Minnesota. However, the basic grant from TAB to MSU was supplemented by a grant provided by the African Bureau with the condition that Michigan State give additional attention to problems of employment and rural development in Tropical Africa.

II. Objectives of the Grant

A. Objectives Restated

1. "To create a framework within which a significant number of U.S. agricultural economists interested in the international aspects of their discipline can work cooperatively on certain research problems of urgent importance to developing countries, thereby increasing the effectiveness of their efforts, and making the most efficient use of scarce research resources; to provide an efficient means for applying the product of this research in ways which will be helpful to the developing countries; and to contribute to the development of professional contacts and collaboration among agricultural economists in the United States

and in the developing countries.

2. "To increase the competence of the University in the area of economic development problems, particularly as they related to the agricultural sector and the relationships between agriculture and other economic sectors, by providing a continuing arrangement for faculty members to conduct research on campus and abroad and to carry on work in developing countries.

3. "To enable the University to provide increased training in economic development and agricultural economics at the graduate level for students from the U.S. and the developing countries.

4. "To provide members of the University faculty the enriching experiences of dealing directly with problems of agricultural development in the less developed countries by arranging for them to serve with AID in capacities which will contribute to the development of their professional skills and to their understanding of how to accelerate agricultural growth in the less developed countries and deal with the practical problems involved in the process."

B. Review of Objectives

Over the four-year period that the grant program has operated at Michigan State University there have been substantial accomplishments toward Objectives 2, 3, and 4. Relatively less has been accomplished on Objective 1 which called for the creation of a framework to facilitate inter-university collaboration on research and related technical assistance activities directed toward the less developed countries.

However, during the past year there has been a concerted effort on the part of the six universities now participating in this set of 211-d grants to work out more effective means of coordination and collaboration. This activity has been encouraged and supported by the staff of the Economics and Sector Analysis Division of the Office of Agriculture in the TAB. This initiative by TAB followed a special review of this set of 211-d grants by TAB. (See TAB report dated December 3, 1973.)

The TAB Special Evaluation focused considerable attention on the "talent sharing" activity called for in Objective 4. It was asserted that the four universities as a group had not fulfilled their obligations to provide faculty for assignments with AID, and especially in staffing the Economics and Sector Analysis Section in the Office of Agriculture of TAB. On this point it appears that Michigan State University has performed relatively well in providing senior, experienced faculty for assignments in Washington and with overseas AID Missions, and in servicing technical assistance requests emanating from AID and other agencies in the LDC's.

The chairman of the Department of Agricultural Economics at Michigan State University has actively participated in the meetings called by TAB to discuss the Special Evaluation Report referred to above and has collaborated in the preparation of the response statement from the four universities which was transmitted to TAB in early June. This statement included several recommendations for improving the future effectiveness of this set of grants.

III. Accomplishments

A. Criteria for Evaluation of Performance

In 1970, when the grant was made, the Department of Agricultural Economics at Michigan State University had already developed an extensive set of involvements in international development. A high percentage of the faculty had participated in either short term or long term institution building projects in LDC's. Countries where major projects had been carried out included: Colombia, Okinawa, Taiwan, Pakistan and Nigeria. Several large research projects had been carried out or were in progress, including a study of Public Law 480 and its impact on selected LDC's, a project to develop and apply simulation techniques to agricultural sector planning in Nigeria and a research and advisory project focused on improving food marketing systems in selected Latin American countries (Brazil, Bolivia and Colombia). The department also had developed a sizeable graduate training program for students from the LDC's and the U.S. who were preparing for careers in international development.

Under these circumstances the 211-d grant has been utilized to strengthen the capacity of the department faculty to conduct relevant research on LDC problems, to provide high quality technical assistance and to train new professionals for research, teaching and administrative roles in the LDC's or with agencies engaged in international development work.

Any attempt to evaluate the Department's performance under this grant should take into account the substantial commitment and involvement in international development activities prior to the 211-d grant and the continued support that the Department has sought and received for research and related activities in the LDC's. This suggests that the performance of the 211-d grant activities must be examined within a framework of a larger interrelated set of research, training, and technical assistance activities. It will be argued later in this report that the 211-d grant has played a major role in further developing and maintaining a larger and very productive departmental program and that without such support the program would have been scaled down and reduced in overall effectiveness.

Some of the criteria that can be used to gauge performance on the 211-d grant should include the following:

1. The number of students from the LDC's and the U.S. trained at the graduate level for international development careers.
2. The positions held by those that have been trained and the quality of their contribution to the resolution of LDC problems.
3. The number of graduate student theses and their relevance to LDC problems.
4. The number of faculty that are involved in research and advisory activities with LDC's or related international development agencies.
5. The quantity and quality of faculty contributions to LDC development through research, teaching and advisory activities.

6. Faculty involvement in talent sharing activities with AID.
7. Faculty and graduate student participation in seminars and workshops on development topics relevant to the problems of the LDC's.
8. The development of collaborative arrangements with other 211-d recipient universities, with other institutions involved with the LDC's and with LDC professional agricultural economists.

B. Training at the Graduate Level

During the 1960's there was a steady increase in the size of the department's graduate training program. This reflected a decision taken by the department faculty in 1966 to expand and strengthen our international programs and to give emphasis to the training of professionals for work in the LDC's.

By 1970 when this 211-d grant program was initiated the department had about 100 graduate students enrolled. Of this total 47 were foreign students. In 1973 total enrollment was still about 100 including 39 from the LDC's, 11 from other foreign countries and 11 U.S. students who were preparing for professional work in international development.

Table I summarizes the composition of the department's graduate student group in the fall term of 1973. Note that nearly two-thirds of the LDC students were enrolled in Ph.D. programs. This reflects a trend towards more M.S. level training in the developing countries. The greatest concentration of students is from Asian countries reflecting a major departmental project in Korea and ongoing research activities in Thailand. (See Table 2 which shows country of origin for graduate

TABLE I

Enrollment of Graduate Students in Agricultural Economics,
Michigan State University, Fall, 1973

<u>A. Native Countries</u>	<u>Total</u>	<u>Ph.D.</u>	<u>M.S.</u>	<u>%Ph.D.</u>	<u>%M.S.</u>
U.S. and Canada	50	38	12	76	24
Other D.C.s	11	7	4	64	36
L.D.C.s	<u>39</u>	<u>25</u>	<u>14</u>	<u>64</u>	<u>36</u>
TOTAL	100	70	30	70	30
<u>B. L.D.C. Enrollment</u>					
<u>by Region</u>					
Asia	18	15	3	83	17
Africa and Middle East	13	5	8	38	62
Latin America	<u>8</u>	<u>5</u>	<u>3</u>	<u>62</u>	<u>38</u>
TOTAL	39	25	14	64	36

TABLE 2

List of Number of Students by Countries and Regions (a)

AFRICA		ASIA		Europe		Canada		North America (U.S.)		South America	
Egypt	1	Ceylon	1	England	1	Canada	3	California	4	Argentina	1
Kenya	4	China	2	Germany	1			Florida	1	Brazil	2
Nigeria	4	Bangladesh	3	Greece	2			Illinois	3	Colombia	3
Tanzania	1	Japan	2	Finland	1			Georgia	1	Guatemala	1
Zaire	2	Korea	5	Ireland	2			Indiana	2		
		Iran	1	Spain	2			Iowa	1		
		Malaysia	1	Sweden	1			Kansas	3		
		Philippines	1					Michigan	13		
		Taiwan	4					Missouri	1		
		Thailand	1					Montana	2		
								New York	5		
								Nebraska	2		
								New Jersey	1		
								Oklahoma	1		
								South Dakota	1		
								Oregon	1		
								Texas	2		
								Utah	1		
								Wash., D.C.	1		
								Washington	1		
								Wisconsin	1		

(a) Data will not match data of Table 1 due to different term involved.

students.) Enrollment of African students is increasing as the African Rural Employment project network expands and develops linkages with African universities and development agencies. In addition the department initiated a special effort in 1973 to recruit qualified graduate students from Africa. Dr. Carl Eicher negotiated a commitment from the African American Institute to finance up to six new students per year through their AFGRAD program for graduate training in agricultural economics at MSU. Department faculty have traveled to several African countries to interview prospective candidates and to develop contacts with several universities, research institutes and government agencies. This effort has been facilitated by Dr. Eicher's African Research Network. By fall 1974, 18 African graduate students will be in residence in the department and 10 non-African graduate students will be concentrating on Africa in their dissertation research.

Part of this expanded effort to train Africans is being directed toward French speaking countries. Two students from Zaire and one from Upper Volta are now in residence. In addition there are three U.S. Ph.D. candidates with fluency in French who are planning to conduct thesis research in a French-speaking African country. During the summer of 1973 Merritt Sargent, a French-speaking Ph.D. candidate, worked in Chad as a consultant to AID and in the summer of 1974 he served with AID in Senegal and the Upper Volta.

With over one-half of our relatively large graduate student group having a strong international orientation, it has been possible for the faculty with international experience to organize specialized development courses and to incorporate LDC problems into other basic courses taken by all graduate students. The quality of the graduate training activity has also been improved by making greater use of outside seminar speakers and visiting professors. The specialized graduate courses dealing with agricultural development problems that have been developed with 211-d grant funds include:

- 862 - Agriculture in Economic Development (Dr. Carl Eicher)
- 865 - Rural Development Administration I (Dr. Garland Wood)
- 866 - Rural Development Administration II (Dr. Garland Wood)
- 962 - Development Planning and Agricultural Sector Analysis (Drs. Stevens, Rossmiller and Harrison)

Other graduate level courses which have a significant international dimension include:

- 805 - Agricultural Production Economics I (Dr. Johnson)
- 810 - Economics of Public Choice (Dr. Schmid)
- 811 - Public Program Analysis (Dr. Schmid)
- 841 - Industrial Organization of Agricultural Markets (Dr. Riley)
- 861 - Agricultural Trade Policies (Dr. Sorenson)
- 906 - Agricultural Production Economics II (Dr. Johnson)
- 941 - Seminar in Food Systems Organization and Policy (Dr. Shaffer)
- 972 - Methodological Approaches to Research (Dr. Johnson)

During 1973-74 two special courses were organized for LDC students and others interested in further developing their abilities to work on LDC problems. Dr. Rossmiller offered a course on the Application of Simulation Analysis to Agricultural Policy Decision Making Situations. This was part of a three-quarter course sequence that is being developed as part of the training component of AID/csd 2975. This is being jointly administered by the Departments of Systems Science and Agricultural Economics. The course program will serve as the core of a one-year training program that can be taken either as part of a degree program or as a special non-degree program. In addition Dr. Kelly Harrison offered in both spring and summer of 1974 a special 4-credit seminar on Marketing Problems in the LDC's. This course draws heavily on the research and advisory experience gained through the AID financed marketing projects in Latin America.

During 1973, 12 of 21 department seminars were devoted to international development topics and 12 development workshops were held for faculty and graduate students. During this year Dr. Akhter Hameed Khan was in residence on the MSU campus, and presented a series of seminars based upon his experiences with the Rural Development Academy in Comilla, Bangladesh. In the 1974 academic year Dr. Khan will return to MSU for the winter quarter for participation in our teaching and seminar program.

Since mid-1973 we have had Dr. Darrell Fienup in residence in the department after spending eight years as Director of the Ford

Foundation's agricultural economics program in Argentina. Dr. Plenuy has participated in the seminar and workshop activities in the department and has counseled and supervised several of the Latin American students. Two professors from the University of the Philippines will join the department for the 1974 academic year. They are Dr. Arturo Gomez and Dr. Kwanchai Gomez who will be on sabbatical leave from their university. They also have appointments with the International Rice Research Institute at Los Banos.

Over the past several years there has been a significant improvement in the quality of the graduate training program in the MSU Department of Agricultural Economics. This is due, first of all, to our increased capacity to selectively recruit competent students through our expanding contacts in LDC's. Many of the LDC linkages stem from AID financed contract projects that involve our faculty.

A definitive evaluation of graduate training programs would require information about graduate student performance for a number of years after graduation. In the short run we can point to the types of positions which recent graduates occupy in the LDC's or with international development agencies as indications of their potential contribution to the improvement of conditions in these countries. The list which follows provides information on positions currently held by individuals who received graduate degrees since 1970 with a major orientation toward international careers.

1970

<u>Name</u>	<u>Native Country</u>	<u>Level</u>	<u>Present Position</u>
Eckert, Jerry	U. S.	Ph. D.	Professor of Agr. Economics, Colorado State University, currently in Pakistan
Hedley, Douglas	Canada	Ph. D.	Ag. Economist, Government of Canada
Davis, Carlton	Jamaica	Ph. D.	Prof. of Ag. Economics, University of Florida
Essang, Sunday	Nigeria	Ph. D.	Faculty, Un. of Ibadan, Nigeria
Gimenez-Dixon, Jorge	Argentina	Ph. D.	BID Honduras, C. A.
Libereiro, Ernesto	Argentina	Ph. D.	OAS, Guatamala, C. A.
Baucom, William	U. S.	M. S.	Employed by MSU to work in Costa Rica AID Project
Ghayur, Aslam	Pakistan	M. S.	Sr. Ag. Economist, Planning Commission of Pakistan
Konjing, Chawat	Thailand	M. S.	Employed by Government of Thailand
Lee, Seong	Korea	M. S.	Enrolled as Ph. D. candidate
Quadir, Ghulam	Pakistan	M. S.	Agr. Planning Division, Gov. of Punjab
Rahman, Khandker	Pakistan	M. S.	Bangladesh Academy of Rural Development, Comilla, Bangladesh
Rochin, Refugio	U. S.	M. S.	Prof. of Ag. Economics, University of California
Rudra, Sulata	India	M. S.	Private Bank in Calcutta, India
Teigen, Lloyd	U. S.	M. S.	Employed by MSU on Korean Project
Torrealba, Pablo	Chile	M. S.	Economist with Marketing Division
Vandermeowe, Barth	So. Africa	M. S.	Gov't. of South Africa
Lins Everton, Ramos	Brazil	M. S.	Gov't of Sao Paula, Economic Research Division.

Wu, Ming Wu	Taiwan	M. S.	Mich. Crop Reporting Service, also Ph. D. candidate
McLean, Canuto	Jamaica	M. S.	Gov't. of Jamaica
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<u>1971</u>			
Billings, Martin	U. S.	Ph. D.	AID/Washington, African Bureau
Chaudhary, M. A.	Pakistan	Ph. D.	Professor, U. of Pakistan
Dickinson, Thomas	U. S.	Ph. D.	Prof. Ag. Econ. Un. of California at Davis
Green, David, A. G.	U. K.	Ph. D.	Prof. Ag. Econ. Univ. College of Wales, Penglais, Wales
Kellogg, Earl	U. S.	Ph. D.	Prof. of Ag Econ. Un. of Illinois
Rochin, Refugio	U. S.	Ph. D.	Ford Foundation in Colombia, S. A.
Barla, Chain S.	India	M. S.	Prof. of Econ. U. of Rajasthan, Indi
Hai, Ngugen Minh	Vietnam	M. S.	Ministry of Planning, Gov't. of Vietnam
Buasri, Prajad	Thailand	M. S.	Ministry of Ag., Thailand
Hassan, Yousef F.	Iraq	M. S.	finishing Ph. D. in resource develop- ment
Samuel, S. N.	Sri Lanka	M. S.	Central Bank Sri Lanka
Soloman, Seyoom	Ethiopia	M. S.	Ph. D. candidate, Ohio State
Lee, Moon Kyu	Korea	M. S.	Employed in U. S. private industry
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1972

McKenzic, Kenneth	Canada	Ph. D.	Canadian Gov't International Development Agency
Sadeghi, Javad M.	Iran	Ph. D.	Prof. of Ag. Econ. Iran
Ahmad, Bashir	Pakistan	Ph. D.	Head, Ag. Planning Section, Gov't. of Punjab, Pakistan
Ahmad, Rais	Bangladesh	Ph. D.	Planning Div. Gov't. of Bangladesh
Igachaba, Francis	Nigeria	Ph. D.	Faculty University of Ibadan, Nigeria

Peacock, David L.	U.S.	Ph.D.	AID, Colombia Mission staff
Nanayakkara, Jpali	Sri Lanka	M. S.	Private firm, Sri Lanka
Graterol, Alejandro	Venezuela	M. S.	private firm
Weber, Michael	U. S.	M. S.	working toward Ph.D. at MSU
Keller, Radrigo R.	Spain	M. S.	Economist with Gov't and Professor in Spain
Silva, Alvaro	Colombia	M. S.	Doing research in Colombia
Zegge, Barnabas K.	Tanzania	M. S.	
Bellati, Sallmon	Ethiopia	M. S.	
Navarro, Luis A.	Nicaragua	M. S.	
Sjamau, Asmarni	Indonesia	M. S.	National Planning Board, Dikarti, Indonesia

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1973

Tarrealba, Pablo	Chile	Ph.D.	Research Economist, Inter-America Institute of Agr. Sciences, IICA San Jose, Costa Rica
Chong, Kwo Ngyuah	Malaysia	Ph.D.	Prof. East-West Center, Hawaii
Frigerio, Norberto	Argentina	Ph.D.	Research Economist, Inter-Amer. Institute for Ag. Sciences, IICA San Jose, Costa Rica
Ladipo, Alasupo	Nigeria	Ph.D.	Un. of Ife, Nigeria
Barla, Chain	India	Ph.D.	Prof. Un. of Rajathan, India
Islam, Tarafder	Bangladesh	Ph.D.	Economist, Bangladesh, Inst. of Development Economics
Nicholas, Samue.	Sri Lanka	Ph.D.	Central Bank for Sri Lanka
Chi Sheng, Cheng	Taiwan	M. S.	currently Ph.D. candidate in resource development
Goquilolay, Nulasri	Thailand	M. S.	not currently employed

Ajobo, Owolabi	Nigeria	M.S.	Cocoa Research Inst., Ibadan Nigeria
Dejene, Tekala	Ethiopia	M.S.	Ag. Economist, Planning Commission, Addis Ababa

C. Research

The 211-d grant has supported three types of research activity including (1) the preparation and development of project proposals; (2) the conduct of faculty and graduate student research related to but not required by existing research contracts; (3) the conduct of research and preparation of theses and publications not directly related to existing research contracts.

During 1973-74 four new AID-related contract proposals were developed.

These included the following:

1. Korean Agricultural Sector Planning Project -- a new three-year contract with the Ministry of Agriculture and Fisheries activated in March 1974. This replaces the Korean Agricultural Sector Analysis Project and supplements the more general ongoing Agricultural Sector Analysis and Simulation Project, AID/csd 2975 that have operated in Korea since 1971.
2. Costa Rican Agricultural Marketing Project -- a new two-year contract with the Costa Rican AID Mission was activated in August 1974. This is a continuation of a previous program that began in 1972.
3. Ethiopian Intensive Agricultural District Project Evaluation -- a new five-year contract to conduct ongoing evaluation of the ADA district project in collaboration with the Institute of Development Research of Haile Sellassie I University. The project was activated in mid-1974 as part of the African Rural Employment Network, AID/csd 3625.

4. Colombian Agricultural Marketing Project -- a proposal has been prepared at the request of the Office of Planning of the Colombian Ministry of Agriculture for a two-year technical assistance activity to begin in the fall of 1974.

In all four projects there are collaborative arrangements with professionals in local institutions to conduct analyses and to jointly prepare reports for use by policy decision makers and program administrators. The information gathered and the experience gained by MSU faculty will also be utilized in more fundamental studies of development processes and in advisory assignments with AID and other international agencies as well as in campus based training programs.

Research activities carried on this past year that were related to ongoing contracts but supported in part by 211-d funds were as follows:

African Rural Employment Network

Eric Tollens has been conducting his Ph.D. dissertation research in Zaire with primary funding support from the University of Louvain (Belgium) and the Ford Foundation. Some 211-d funds were used for field data collection. The title of Tollens's thesis is "A Socio-Economic Analysis of Cotton Production in Northern Zaire." While in Zaire, Tollens has been serving as Acting Head of the Department of Agricultural Economics at the National University of Zaire in Yambambi. Tollens returned to the MSU campus in the summer of 1974 to complete the writing of his thesis with 211-d support.

Fred Winch has been conducting his Ph. D. dissertation research in Ghana with financial support from the Ghanaian Ministry of Agriculture and the Near East Foundation. His dissertation topic is "A Micro-Economic Study of Rice Production in Northern Ghana and a Regional Analysis of Selected Policy Alternatives for Increasing Production." Winch returned to the MSU campus in the summer of 1974 to complete his dissertation with 211-d support.

Tom Zalla has been conducting his Ph. D. dissertation research in Tanzania with funding support from a Foreign Area Fellowship and a grant from the Ford Foundation. His thesis topic is, "Economic and Nutritional Aspects of Smallholder Milk Production in Northern Tanzania." While in Tanzania he has been a Research Fellow in the Economic Research Bureau, University of Dar es Salaam. Zalla returns to the MSU campus in the fall of 1974 to complete his thesis with 211-d support.

James Kocher has been serving as a Research Fellow and staff member at the University of Dar es Salaam while conducting his doctoral thesis research on "Rural Development and Demographic Change in Lushoto and Moshi Districts." His field work has been financed by the Population Council. He plans to return to MSU to finish writing the thesis in early 1975.

Dean Linsenmeyer departed for Sierra Leone this past June to begin work on his Ph.D. thesis which has the tentative title, "The Economics of the Fishing Industry of Sierra Leone." He is funded by a Foreign Area Fellowship. While in Sierra Leone he will be a Research Fellow in the Department of Agricultural Economics at the University of Sierra Leone. He will be working as part of the African Rural Employment Research Team which includes Dr. Derek Byerlee from the MSU Department of Agricultural Economics.

Three U. S. doctoral candidates with previous Peace Corps experience have assisted in the development of the African Rural Employment Library by preparing special bibliographies of agricultural economics materials in nine French speaking West African countries. This work was supported by 211-d funds.

The 18 African students who are supported by fellowships from AFGRAD, AID, foundations and foreign governments, and 10 non-African students specializing in research on Africa make extensive use of the African Rural Employment Library collection and also assist in expanding and updating this collection. The AID/csd 3625 project provides funds for the periodic distribution of bibliographies and publications to the Research Network members in African countries.

Dr. John Hanson, professor in the Michigan State University College of Education has just completed a three-year Ford Foundation

financed study focused on education in the rural development in East African countries. Beginning in May 1974 he has been on full 211-d support to produce a series of papers on the following topics:

- a. The role of primary and secondary education in rural development.
- b. The role of literary training in promoting rural development.
- c. Tanzania's experience in redirecting its entire educational system -- primary, secondary and university -- to promoting rural development.

Agricultural Sector Analysis

Felix Nweke developed a research plan for a systems simulation of the Nigerian forestry industry and departed in June to spend six months in Nigeria collecting data. He will return to the MSU campus to finish his thesis under the direction of Dr. Glenn Johnson. The study is supported by 211-d funds.

Alvara Posada completed a Ph.D. thesis entitled, "A Simulation Analysis of Policies for the Northern Colombia Beef Cattle Industry" under the supervision of Dr. Johnson.

There are several U.S. and Korean graduate students that currently have part time research assistantships under the AID-financed simulation project. Some 211-d support may be used to carry them through their thesis preparation.

Dr. Victor Smith, professor in the Department of Economics, has further analyzed data obtained from his studies of the component of the agricultural sector planning model in Nigeria, under AID/csd 2975. Funds from the 211-d grant have provided partial salary support for this activity which has produced a book manuscript entitled 'Efficient Resource Use For Tropical Nutrition: The Nigerian Case,' which is now at the Bureau of Business and Economic Research.

Upon completion of his Ph. D. degree at MSU Dr. Lloyd Teigen was employed with 211-d funds as a Research Associate and sent to Korea in January 1973 to carry out a one-year study on "The Trade and Balance of Payments Effect of Korean Agricultural Development." This work was seen as complementary to the ongoing agricultural sector analysis work under AID/csd 2975 and AID/ead 184. Dr. Vernon Sorenson and Dr. Ed Rossmiller have participated in the direction of this research activity. The reports and manuscripts that have been produced by Dr. Teigen are as follows:

KASS Issue Paper 3 -- Trade Analyses of Work: Retrospect and Prospect, April 20, 1973, 40 pp.

Unpublished paper -- A Nonmonetary Equilibrium Model for Currency Devaluation, April 23, 1973, 16 pp.

KASS Working Paper No. 73-5, A Model for Private Storage Behavior Under Competition and Monopoly with Application to Korean Rice Storage, December 1, 1973, 69 pp.

KASS Issue Paper 5 - Report on the Modifications of the KASS

Model for International Trade Analysis,

November 26, 1973, 16 pp.

On January 1, 1974 Dr. Teigen shifted from 211-d support to a position with the Korean Agricultural Sector Planning Project.

Latin American Marketing Systems

Upon return from a 21-month assignment in Costa Rica under AID Contract No. 515-234-T Mr. Michael Weber has received 211-d support while he prepares a doctoral dissertation utilizing data and information from the Costa Rica project. The thesis topic is "The Role of Municipal Government in Fomenting Improvements in Rural Food Assembly and Distribution Systems in Costa Rica." Weber's thesis supervisor is Dr. Kelly Harrison.

Alvaro Silva returned to Colombia in December 1973 to conduct field work on his Ph.D. thesis which will evaluate some of the changes in the Bogota food system that have been based in part upon MSU, AID-financed research and advisory work in Colombia under AID Contract No. LA/364. Silva's thesis topic is "An Evaluation of the Impact of Corabastos Marketing Projects on Economic Development in the Bogota Foodshed." Some 211-d funds are being utilized for field data collection although most of the support for his doctoral program has been provided by the Ford Foundation.

Ken Shwedel has prepared a doctoral thesis proposal and will be carrying out field work in Costa Rica while serving as a member of the MSU resident team under AID Contract 515-250-T. The thesis topic is "Market Restrictions on Small Farm Agriculture."

Dr. Kelly Harrison has completed a preliminary draft of a 200-page document which summarizes the experiences of the Michigan State University team that has been involved in AID-financed field research, advisory and training programs to improve agricultural marketing systems in selected Latin American countries. This program began in 1965 and has operated in Puerto Rico, Northeast Brazil, Bolivia, Colombia, and Costa Rica. This summary publication is directed to AID personnel, public officials in the developing countries, to technical advisors as well as students and researchers. It will be published in both Spanish and English.

Dr. Garland Wood has utilized materials from the AID/csd 3182 project dealing with the management of agricultural development programs by public institutions to prepare a paper entitled "Public Institutions and the Small Farmer." This will be included in a book to be published by Praeger Press in 1974. Dr. Wood has also prepared materials for an Agricultural Development Council publication on agricultural administration. This is designed for use by the teachers. Dr. Wood has also submitted a paper for inclusion in the readings related to the training paper.

Research Activities Not Closely Related to Existing AID Contract Programs

Using a combination of 211-d and Ford Foundation support, Dr. Warren Vincent has become involved in a research activity in Thailand that has the objective of developing a farm-level computer simulation model for more effective analysis of peasant experience with "multiple

cropping systems." This involves collaboration with Dr. Allen Thodey and other members of the Agricultural Economics Department, Chiang Mai, Thailand. This farm level simulation complements previous collaborative effort involving a poly-period linear programming model for the analysis of alternative cropping systems in the Chiang Mai Valley. Dr. Vincent spent one month in Thailand in early 1974 during which time he worked with members of the Multiple cropping project and supervised data collection by Mrs. Nulasri Goquolay, a Thai doctoral candidate at MSU.

Other doctoral theses that are well underway that have been or are being supported by 211-d funds include the following:

Loukas Anaukas, "Potential Livestock Production Adjustments on Small Farms in Macedonia, Greece,"

supervised by Dr. Warren Vincent

Gorden Gemmill, "Economic and Policy Conditions that Affect

World Sugar Trade," supervised by Dr.

Vernon Sorenson

Tirso Paris, "Systems Simulation of Rice Production and Marketing

Systems at the Village Level in the Philippines,"

supervised by Dr. Robert Stevens

Christos Kamenidis, "Improving Efficiency of Beef Marketing

in Greece -A Slaughter Plant Locational Analysis,"

supervised by Dr. Vernon Sorenson

Theses that were completed during 1973-74 on topics related to agricultural development in the LDC's are listed below and abstracts are included in an appendix to this report.

Chain Barla, "Agricultural Taxation and Economic Development in India: A Study of the Potential of an Agricultural Income Tax in Financing the Plans," Ph.D. thesis supervised by Dr. Manderscheid.

Bunloe Sutharaman, "The Effect of Changing Areas and Levels of Technology of Corn and Cotton Production on the Net Foreign Exchange in Thailand." Ph.D. thesis supervised by Dr. Vincent.

Tom Dickey, "A Mechanized Corn Project in Costa Rica: A Case Analysis," M. S. thesis supervised by Dr. Wood.

Tarafer Islam, "Alternative Low-Lift Pump Irrigation Policies in Bangladesh: An Economic and Financial Analysis," Ph.D. thesis supervised by Dr. Stevens.

Teck Pee, "The Internal Rate of Return on Twenty-Five Years of Rubber Research in Malaysia," M. S. thesis supervised by Dr. Stevens.

Paulo Silva, "Estimating Least Cost Human Diets in the Northeast of Brazil with Stochastic Programming -- Theoretical Issues and Policy Implications," Ph.D. thesis supervised by Dr. Connor.

In addition to the graduate students theses research there have been several publications prepared by faculty. For the most part these are contributions that draw on previous research and advisory activities and are not directly related to current contract projects.

Books

- (1) Rural Development in Bangladesh and Pakistan, edited by Dr. Robert Stevens with assistance from Peter J. Bertocci and Hamza Alavi, accepted by the University of Hawaii Press for release in 1975.
- (2) Tradition and Dynamics in Peasant Agriculture--Economic Studies by Small Farms in Asia, Africa and Latin America, manuscript by Dr. Robert Stevens that is being circulated to potential publishers.
- (3) International Trade Policy: Agriculture and Development, by Dr. Vernon Sorenson, accepted for publication by the Michigan State University Bureau of Business Research.

Efforts to Develop Linkages with Other Universities

During this past year there has been a renewed effort to develop closer, more collaborative linkages with the other five universities having similar 211-d grants. Four meetings were held with representatives of the other universities and AID. Progress has been made in identifying opportunities for more effective procedures for jointly arranging for and supervising graduate student research in the LDC's. (See minutes of March 6 meeting held at Minneapolis.) Arrangements for greater interchange of research publications have also been discussed and generally agreed upon. This coordination extends to joint planning of

research activities where faculty and graduate students from two or more institutions might be involved. It has been recognized that some universities have developed institutional ties in particular countries which other universities might utilize in carrying out research.

For example, the African Rural Employment Network has developed a system of inter university cooperation in facilitating research by doctoral students in Africa. A Sierra Leonan graduate student at Ohio State - Joseph Tomm - is collecting data for his dissertation in Sierra Leone as a member of the Michigan State University of Sierra Leone Research Team. Also, an Ethiopian graduate student at Wisconsin - Ato Gebremidel Menghister - will return to Ethiopia in January 1975 to collect data for his dissertation under the MSU/IDR Research Team. Finally a graduate student at Cornell - Peter Matlon - was assisted by MSU in arranging for his field research in northern Nigeria.

Currently Michigan State University has active linkages with several African universities including the University of Sierra Leone, the University of Ibadan (Nigeria) the National University of Zaire, the University of Dar es Salaam, Haile Sellassie I University (Ethiopia.)

In the Asia area the MSU Department of Agricultural Economics has significant contacts with Chiang Mai University (Thailand); Kasetsart (Thailand); The Pakistan Academy for Rural Development at Peshawar; The University of the Philippines; Sogang University, Korea; and the agricultural colleges in Bogor and Gadjah Mada, Indonesia.

In Latin America it has been difficult to maintain viable working relationships with local universities. In Colombia the Department has contacts with individuals in the National University Faculty of Agriculture at Bogota, the University of the Andes (Bogota) and the graduate training program at the ICA research center near Bogota. The MSU involvement with the graduate training program at Castelar, Argentina, has recently been disrupted. Because of the difficulties in maintaining linkages with Latin American universities the MSU contacts have shifted to other types of development agencies such as the Inter-American Institute for Agricultural Sciences, headquartered in San Jose, Costa Rica, but operating programs throughout Latin America. Another type of linkage has evolved with CORABASTOS, a food marketing development agency serving the Bogota area.

During the past year the faculty of the Department of Agricultural Economics have undertaken several activities to further strengthen U.S. university efforts to assist the LDC 's. These activities include the following:

Dr. Carl Eicher continues to serve as Chairman of the Overseas Liaison Committee of the American Council on Education. This committee has developed a five-year plan of work which focuses on educational liaison activities with emphasis on linking American scholars with scholars and administrators in Africa, the Caribbean, Southeast Asia and the South Pacific.

Dr. Darrell Fienup has participated in a series of three regional workshops sponsored by American Agricultural Economics Association to review and evaluate the role of the U. S. profession in training foreign students and to consider ways to better meet the needs of the LDC countries for trained agricultural economists. One of the background papers on "Graduate Training and Research in Agricultural Economics in Latin America, A Review of the Role and Performance of Eight Graduate Programs" used in the workshops was prepared by D. Fienup. At the annual meeting of the American Agricultural Economics Association held at Texas A & M University in August 1974, Dr. Fienup presented one of three major papers on the training of foreign students. Dr. Fienup's paper was entitled "Institutional Roles and Training Issues in International Agricultural Development."

Early in 1974 Dr. Harold Riley accepted an assignment by the President of the AAEEA to head a committee that would review and evaluate the AID-financed Research and Training Network that has been operating since 1970 by the Agricultural Development Council. Dr. Fienup assisted in this evaluation along with Dr. Peter Dorner, University of Wisconsin; Dr. Roger Fox, University of Arizona; and Dr. Price Gittinger, International Bank for Reconstruction and Development. The report has been completed and is being submitted to AID in early September.

In June 1974 Dr. Kelly Harrison served as the coordinator of an ADC-RTN Workshop held on "Small Farmer Marketing Problems."

Twenty professionals participated in the workshop held at Michigan State University. A seminar report has been prepared by Dr. Harrison and Ken Shwedel, an MSU graduate student.

Faculty Involvement in Talent Sharing Activities

One of the unique features of this set of 211-d grant was the grant agreement provisions for the utilization of university faculty in talent sharing assignments with AID and other development institutions. These assignments were seen as beneficial to AID and the universities in their efforts to achieve a shared goal of accelerating agricultural development in the LDC's.

Michigan State University has made a concentrated effort to meet the ten-man year talent sharing commitments included in the 211-d agreement. During the first two years of the grant, Dr. L. W. Witt served on a direct-hire assignment with the Agricultural Economics and Sector Planning Division of the TAB in AID/Washington. Dr. Harold Riley served as a special Assistant to the Director of the AID Mission in Bogota, Colombia. From 1971 to 1973 Dr. Ed Rossmiller was on an assignment in Korea as Director of the MSU project which assisted the Korean government in the development of an agricultural sector analysis using simulation as one of the basic analytical tools. Dr. Dale Hathaway, then chairman of the Department of Agricultural Economics at Michigan State University, obtained the approval of Dr. Art Coutu, then head of the TAB Agricultural Economics and Sectoral Analysis Division, to designate

Dr. Rossmiller's Korean service as part of the MSU talent sharing commitment. Thus, during the first three years of the agreement period, MSU provided a total of six-man years of long-term service to AID by regular tenured faculty who made up part of the core staff working on international agricultural development problems.

The grant agreement also provided for the establishment of an International Agricultural Economics Panel. During the first few months of the grant period the Department of Agricultural Economics identified 14 faculty members as Panel Members. However, the Panel was never fully activated by TAB. In a response to the TAB Special Evaluation of the 211-d grants the four universities recommended that the International Panel be established within the year with TAB taking the responsibility for forming and maintaining the Panel. The Department of Agricultural Economics at MSU stands ready to cooperate should there be follow-up action by TAB.

Because of the extensive involvement of the MSU Department of Agricultural Economics international activities there are frequent requests from AID Missions and other international agencies for short-term assistance. Some of this assignment is provided through ongoing AID contracts with Regional Bureaus and/or Missions. In reporting on 211-d grant accomplishments we have called attention to these technical assistance assignments as evidence of the utilization of

MSU faculty competence. During the first three years of the grant period the MSU Department of Agricultural Economics provided over 40-man months of short-term, technical assistance.

During 1973-74 the Department has not had a staff member on a long-term, "talent sharing" assignment with AID. However, faculty have participated in a substantial number of important assignments directly relevant to the goals and objectives of the 211-d grant. These activities are summarized in Section V of this report.

IV Impact of Grant Support Activities in Developing Institutional Capabilities.

This 211-d grant has made it possible to recruit and maintain a larger and more competent faculty group with greater involvement in international agricultural development activities than could have occurred without this financial support. As has been acknowledged earlier in this report, the MSU Department of Agricultural Economics was already deeply involved in international research, training and advisory activities when the 211-d grant agreement was made in 1970. Since 1970 the Department has been able to develop new projects that are now funded by AID contracts that deal directly with important policy issues and programming needs of several LDC's. These contract activities have involved linkages with AID Missions, the Regional Bureaus and TAB as well as collaborative arrangements with government agencies, other development institutions and with individual foreign scholars. Concurrently the Department has been able to strengthen the graduate training program through improved recruiting procedures and more relevant training and research experiences dealing with LDC problems.

The 211-d funds have been used in about equal proportions for faculty salaries and for graduate student support. The faculty salary support has increased the Department's capability to develop new research, training and technical assistance projects. An example is the developmental work which led to the approval of the African Rural Employment Projects, AID/csd 3606 and 3625. The grant has also expanded the opportunities for faculty to prepare books, other publications and papers based upon information and experiences gained through involvement in contract projects and through research carried on with graduate students. In some instances the preparation of papers relate closely to workshops and conferences sponsored by international development agencies. In addition, 211-d funds have enabled the Department to bring in outstanding individuals such as Dr. Rainer Schickele and Dr. Ahkter Hameed Khan

to serve as visiting professors.

In mid-1974 the Department had the following core faculty group with substantial involvement and a continuing interest in international development and more particularly in the problems of rural development in the LDC's.

Dr. Glenn Johnson	Professor
Dr. Carl Eicher	Professor
Dr. Warrent Vincent	Professor
Dr. Garland Wood	Professor (on leave to the Ford Foundation)
Dr. Ed Rossmiller	Associate Professor
Dr. Kelly Harrison	Associate Professor
Dr. Derek Byerlee	Assistant Professor
Dr. Darrell Fienup	Professor (Two-year appointment)
Dr. Mike Abkin	Assistant Professor (Systems Science and Agricultural Economics)

Other faculty who have had substantial foreign experience and who continue to participate in shorter term technical assistance activities and supervise foreign graduate students are as follows:

Dr. Vernon Sorenson	Professor
Dr. James Shaffer	Professor
Dr. Henry Larzelere	Professor
Dr. Robert Stevens	Associate Professor
Dr. Harold Riley	Professor
Dr. John Brake	Professor

There are several other faculty with foreign experiences who are deeply involved in the graduate training program and who occasionally become involved in foreign project activities.

During 1973-74 Dr. Lawrence Witt, one of our most experienced international specialists retired from our faculty and accepted a high-level staff position in the Department of State as an advisor on U.S. agricultural trade policy. On August 31, 1974, Dr. Dale Hathaway also retired from our faculty and will continue in his present duties as Program Advisor with the Ford Foundation.

Without the 211-d grant the Department of Agricultural Economics at MSU would have reduced its involvements in international activities over the past four years. There would be fewer faculty members working on LDC projects. Funding and accountability pressures would have made it necessary to redirect faculty time into domestic projects and to reduce the size of our faculty. This has happened in Departments of Agricultural Economics at other U.S. universities.

Currently approximately 25 percent of the salaries for our faculty comes from international projects and grants. If this core of faculty competence is to be retained and remain viable, it will be necessary to have the assurance of some long term arrangements for university participation in LDC development programs and a component of flexible 211-d type funds to maintain stability in faculty salary support for this type of work.

A large and, in the long run, probably the most important institutional resource created by this grant is the graduate students trained for careers in international development. A list of graduates and their current place of employment was presented in Section III -B of this report. See pages 15-18.

The 211-d grant has contributed directly and indirectly to the development of library and reference services that strengthen both the graduate training program and the research activities in the Department. Some 211-d funds have been used to acquire library materials, but more importantly the faculty and graduate students supported by 211-d funds have ordered and assembled materials directly related to LDC problems using other university resources. The Department now has a smoothly functioning reference room with a qualified librarian in charge and a special collection of publications of African rural development. The latter collection

has been financed largely out of AID/csd 3625 with some support from the 211-d grant.

The 211-d grant has helped to maintain a general university commitment and capability in international programs. The international activities of the Department of Agricultural Economics continue to be a large component of the university's total international programs. Department faculty are frequently called upon to participate in seminars and conferences sponsored by other units within the university. Projects undertaken by the Department of Agricultural Economics are developed and negotiated with administrative support from the Office of International Studies and Programs and the Institute of International Agriculture. The 211-d grant has also provided funds to support research and preparation of publications by faculty in other departments, e.g., Drs. Carl Liedholm and Victor Smith of the Department of Economics, and Dr. John Hanson in the College of Education.

The international activities of the Department are having some significant spin-off effects on the more domestically oriented departmental programs. The undergraduate teaching programs now include three courses dealing with the LDC development problems. These courses are as follows:

- 260 World Food, Population and Poverty, taught by Professor Rcssmiller
- 363 Economic Development of Tropical Africa, taught by Dr. Liedholm and Dr. Eicher, with visiting scholar participation
- 462 Rural Transformation in Developing Societies, taught by Dr. Stevens.

The Department has developed two new domestically oriented projects which will utilize the skills that have been developed in the AID-financed research on systems

simulation applications to agricultural sector planning. Drs. Ferris, Rossmiller and Johnson are initiating a new simulation, sector-type study of Michigan agriculture. Drs. Sorenson and Ferris are directing a more macro study of U.S. agriculture and the impacts of changing world and domestic demand and supply conditions. Both of these projects will make extensive use of the knowledge and skills that have been developed through participation in international projects, part of which were supported by 211-d funds.

Finally we believe that we have developed a high-quality faculty group with a strong commitment to help solve some of the perplexing problems now confronting the world community. The Department has a reputation for effective performance on international commitments and the 211-d grant has been a strategic and critical element in the building and maintaining of this program.

V. Utilization of Institutional Resources in Development

Much of the utilization of the institutional resources attributed to this grant has been described earlier in Section III of this report or will be covered in Section VI which lists departmental contracts closely related to the ultimate objectives of the 211-d grant. This section of the report will be confined to faculty activities not reported elsewhere. These are as follows:

Dr. Dale Hathaway continued on leave from the Department while serving with the Ford Foundation as Senior Program Advisor to the Asia-Pacific Area. This assignment began in September 1972. His primary responsibilities have been to stimulate and monitor agricultural development programs in the LDC's.

Dr. Glenn Johnson participated in a ten-day workshop in Cairo, Egypt, where a group of FAO and Egyptian agricultural economists and officials, and other consultants discussed agricultural sector planning. The conference was sponsored by the FAO and the Egyptian government. Dr. Johnson later participated in a three-day conference on agricultural sector planning held in Nairobi, Kenya under Ford Foundation sponsorship. He has also conferred several times with the U.S. Office of Technology Assessment on the transferability of Korean and Nigerian systems modeling techniques to an assessment of U. S. and world agricultural information systems.

Dr. Carl Eicher participated in numerous seminars and workshops organized by the World Bank and the ADC and is a member of the National Academy of Sciences Advisory Panel on arid lands of sub-Saharan Africa.

Dr. Warren Vincent served as an advisor to the Ford Foundation program in Thailand. This involved collaborative research activities with Dr. Alan Thodey, Ford Foundation Economist, who is working on alternative cropping systems for the Chiang Mai Valley. While in Thailand in early 1974, Dr. Vincent presented a paper entitled "A Systems Approach to Irrigated Agriculture" at a one-week conference sponsored by the Agricultural Development Council on Irrigated Agriculture in Northern Thailand held at Chiang Mai University.

Dr. Mike Abkin attended a symposium in Vienna sponsored by the International Institute for Applied Systems Analysis to discuss the "Multilevel Regionalized World Model" that has been developed by the Mesorovic -Pestel

team with Club of Rome sponsorship.

Dr. Darrel Fienow spent four weeks assisting the Agricultural Economics and Sector Analysis Division of TAB in a review of several of the Bureau's research and 211-d grants to determine if the design of the projects and potential utilization and delivery of results have been appropriately considered with regard to their socio-economic consequences and implications. Subject matter areas of projects considered included tropical soils, pest management, weed control, and livestock production.

Drs. James Shaffer and Kelly Harrison spent two weeks in the Dominican Republic in response to a request from the AID Mission for assistance on the agricultural marketing components of an agricultural assessment.

Dr. Garland Wood spent one week in the Dominican Republic as the head of a Michigan Partners for Alliance Committee that assessed the possibilities for future program activities.

Dr. Kelly Harrison later spent ten days in Bogota, Colombia, responding to a request from a regional food marketing agency (CORABASTOS) for advisory assistance on future program development and assisting Alvara Silva, an MSU Ph. D. candidate, in planning his thesis research.

Dr. Robert Stevens participated in a two-day, World Bank conference on rural development in the LDC's, where he presented a paper, "The Potential of Comilla Rural Development Models for Small Farm Areas in Other Developing Nations."

In addition to the above activities, the Department faculty have carried a heavy work load on AID contracts. The time spent outside the U.S. on these contracts is summarized below for the period July 1973 - June 1974.

Korean Agricultural Sector Analysis

(AID/csd 2975, AID/ead 184 and a new contract with the Korean government

	<u>Total Weeks</u>
Dr. Ed Rossmiller, Project Director	12
Dr. Glenn Johnson	2
Dr. Tom Manetsch	4
Dr. Lloyd Teigen	26

African Rural Employment Research Network

(AID/csd 3625)

Dr. Carl Eicher	3
Dr. Derek Byerlee	16
Dr. Vernon Sorenson	3
Dr. James Shaffer	3

Costa Rican Marketing Project

(AID/515-234-T)

Dr. Kelly Harrison	5
Dr. James Shaffer	2
Dr. Darrell Fienup	1
Michael Weber	<u>32</u>

Total all projects (a) 109

(a)

Does not include all personnel from other MSU departments or those hired from outside MSU for project positions.

VI Other Resources for Grant-Related Activities

During 1973-74 the Department was actively involved in five contracts directly with AID and a sixth contract with the Government of Korea. The level of expenditures on these contract activities are summarized below.

<u>Title</u>	<u>Contract No.</u>	<u>Expenditures Estimated for 1973-74</u>
Rural Employment in Tropical Africa	AID/csd 3625	\$189,000
Agricultural Sector Simulation	AID/csd 2975	382,000
Korean Agricultural Sector Analysis	AID/ead 184	150,000
Korean Agricultural Planning Project	contracted directly with Republic of Korea March 1974	26,000
Costa Rican Agricultural Marketing Project	AID/515-234-T	41,000
Rural Agricultural Program Management	AID/csd 3132	13,000

Near the end of the fiscal year a new contract was signed with the Economic Development Institute at Haile Sellassi I University in Ethiopia. This is an AID-financed project which will describe and analyze the ADA intensive rural development project. Dr. Carl Elcher will direct the project and coordinate this activity with the African Research Network operating under AID/csd 3625.

A contract proposal from the Colombian Ministry of Agriculture was under negotiation at the end of the fiscal year. This is a two-year project that calls for approximately 30 man-months of senior faculty technical assistance directed toward the further development of the Colombian agricultural marketing system.

Michigan State University has had a long term involvement in Colombia with a series of research and advisory activities in agricultural marketing.

There is a high degree of complementarity between the 211-d grant and the contract activities of the Department. The contracts provide opportunities for our faculty and graduate students to work with LDC governments and development institutions on pressing economic and social problems. The 211-d grant provides support for graduate student research that can relate to the contract activity and in any case, can be facilitated by the institutional and professional linkages which department faculty develop through contract activities. Also, the contract activities become an important part of a graduate student recruitment process that can benefit several U.S. universities.

It should be recognized that Michigan State University provides considerable resources for the 211-d grant program. All overhead costs which include office space, administrative support, library and computer center research facilities are provided by the University. In addition, the cost of faculty time which actually goes into the teaching and supervision of foreign graduate students is substantially greater than the compensation which the University receives from student fees, consequently there is a sizeable net contribution by the University and, ultimately the State of Michigan, to the training of foreign students.

VII Plan of Work for 1974-75

This is the fifth and last year of activity under the present 211-d grant. It is hoped that the grant will be extended for another five years. However, until such time as there is assurance of an extension, it will be necessary to manage grant activities on the basis of the scheduled June 30, 1975, termination date. For the next few

months the graduate training activity will continue at the present high level of activity with approximately 50 students preparing for careers in work on LDC rural development problems. However, the planning for overseas research involvements for the current group of graduate students will be curtailed in anticipation of the 211-d grant termination. Attempts will be made to seek out alternative sources of fundings for graduate student research and dissertation writing. The prospects for the use of state funds to support research on LDC-type problems are dim. There are possibilities for some shifting of faculty and graduate student efforts toward research on domestic problems and to obtain financial support for this type of work. If this is done, the Department will begin shifting away from international program activities. At the same time our capacity to provide high quality graduate education for LDC students will start to decline.

During February and March of 1975 the Department Graduate Committee will be reviewing and taking action on applications for admission for the 1975-76 academic year. In anticipation of the 211-d grant termination, we will be scaling down on our total assistantship commitments by as much as 10 to 15 students. This action will have its greatest impact on the admission of U.S. students who have strong interests in international careers and students from LDC's who do not have assured funding to carry them through formal coursework, thesis research and final preparation of the dissertation.

During 1973-74 the Department will complete a review and evaluation of its international activities and establish policy guidelines and goals for the next five to ten years. The AID review of our 211-d grant program and subsequent decisions regarding AID-University relationships will have a critical influence on the Department's commitment to future international involvements.

Meanwhile, steps are being taken to develop greater integration of our international activities through on-campus workshops and seminars which provide opportunities to share experiences and examine alternative approaches to comprehensive rural development. During winter term Dr. Ahkter Hameed Khan will be in the Department as a visiting professor and will be involved in a graduate seminar on rural development administration. Dr. Khan will also lead a two-week workshop on Rural Development (March 3- 14) which will be open to ten scholars and government officials from developing countries and ten representatives from donor agencies; six of the ten donor agency representatives will be AID officials from the various bureaus and Missions. Dr. Carl Eicher is organizing this workshop.

During the academic year two professors, Drs. Arturo Gomez and Kwanchi Gomez from the University of the Philippines will spend their sabbaticals with the Department and will participate in our research activities and related seminar programs. Mr. Ralph Edwards, of the African Bureau of AID, will also be in residence for the year and will contribute significantly to our graduate training and research program with African students.

The research activities directly supported by 211-d funds will continue to have a heavy orientation toward African rural development problems. Three doctoral candidates are back on campus after extensive field research in Zaire, Ghana and Kenya and will be completing their dissertations within the year. A fourth Ph.D. candidate will return from Kenya later in the year. A Nigerian doctoral candidate is currently back in his home country collecting data and will return to campus to complete the thesis later in the year. Meanwhile, Dr. John Hanson is expected to complete at least three major papers on education in African rural development.

Grant funds will also be used to support the thesis work of at least seven other students, three of which are foreign students who are working on thesis topics dealing with problems in their own countries.

Faculty members who will be engaged in research supported by 211-d funds include the following:

Dr. Warren Vincent will continue his work on the application of simulation techniques to the analysis of multiple cropping alternatives in Thailand. He will also participate in a conference being held at the East-West Center on fertilizer use in the LDC's which may lead to subsequent involvement in a research activity.

Dr. Kelly Harrison will continue research on the problems of organizing more effectively coordinated agricultural marketing systems with field research activities in Colombia and Costa Rica. He will also maintain a working relationship with the Inter-American Institute of Agricultural Sciences agricultural marketing program and will seek to carry forward the collaborative research and program development activities that have been initiated with this group. The group includes three individuals who received their graduate education with our Department of Agricultural Economics.

We also plan to utilize some 211-d funds to support faculty participation in selected conferences sponsored by AID, the World Bank, the InterAmerican Development Bank, FAO and other international development agencies on topics dealing with high priority LDC problems. Faculty will also be encouraged to participate in the ADC/RTN workshops. Several papers will be prepared and published as a part of these conference and workshop activities.

Finally, appropriate steps will be taken to improve communications among the six universities having agricultural economics 211-d grants. This will involve publication interchanges and occasional meetings to discuss program activities.

VIII Report on Expenditures for 1973-74 and Planned Expenditures for 1974-75

The original grant was for \$625,000 for a period of five years. Expenditures through the end of the first four years totaled \$451,298, leaving an unexpended balance of \$173,720. Projected expenditures for 1974-75, the fifth and last year of the grant, are \$154,000. See Table 3. Assuming actual FY 1975 expenditures are at the projected level the unexpended balance on June 30, 1975, would be \$19,702.

TABLE 3

Summary of Expenditures of 211-d Grant Funds - Michigan State University

Expense Categories	211-d Expenditures			
	1973-74	Cumulative Total - 4 years	Projected 1974-75	Projected 5-year Total
Salary and Fringe Benefits	\$136,654	\$ 412,457	\$140,000	\$552,457
Travel	2,810	16,740	6,000	22,740
Equipment		454		454
Other Direct Costs	2,858	21,647	8,000	29,647
TOTALS	\$142,322	\$451,298	\$154,000	\$605,298

TABLE 4

Details of Michigan State University 211-d Grant Expenditures, FY 1974

Salaries, Faculty \$69,730

Eicher, C.K.	\$4,240
Fienup, D.	11,822
Hanson, J.	1,666
Harrison, K.	11,056
Johnson, G.	2,322
Pulaski, B.	2,536
Smith, V.	5,376
Sorenson, V.	2,600
Stevens, R.	4,777
Teigen, L.	6,188
Vincent, W.	8,474
Weber, M.	2,723
Witt, L.	1,450
Wood	4,500

Salaries, Graduate Assistants \$56,622

Ananikas, F.	\$1,110
Barla, C.	1,575
Bocchetto, R.	2,160
Chuta, F.	2,160
Dickey, T.	3,270
Fattoo, H.	3,330
Gemmill, C.	4,935
Goquolz, N.	1,110
Kamenidis, C.	2,190
Linsenmeyer, D.	4,380
Nweke, F.	4,935
Paris, T.	3,330
Patrick, J.	3,330
Pryor, S.	1,200
Shields, J.	2,190
Shwedel, K.	4,650
Wallender, D.	4,314
Wandschneider, D.	3,123
Wilcock, D.	3,330

TOTAL (Graduate Assistants and Faculty) \$126,352

Secretarial 2,167

TOTAL SALARIES \$128,519

Fringe Benefits

\$8,135

Retirement (10% of all salaries of
Faculty who are enrolled in TIAA-
CREF Program)
Social Security (5.8% of all salaries
up to \$10,800)
Hospitalization (University contribu-
tion for those enrolled \$35.55 per
month)
Unemployment Compensation (1/2 of 1%
of Salaries for those covered under
University rules)

TOTAL SALARIES AND FRINGE BENEFITS

\$136,654

Travel and Transportation

Instate Travel \$108
Outstate Travel 1,928
Overseas Travel 753
Transport Things 21

TOTAL TRAVEL/TRANSPORTATION

\$2,810

Other Direct Costs

Postage/Telephone/Cables \$102
Rentals -0-
Printing 516
Services 1,338
Supplies -0-
Books and Magazines 94
Intangibles 808

TOTAL OTHER DIRECT COSTS

\$2,858

TOTAL EXPENDITURES

\$142,322

APPENDIX TO ANNUAL REPORT

211-d Grant

Michigan State University

1973-1974

Abstracts of Graduate Theses Completed in 1973-74

Chain Barla	Ph.D.
Tom Dickey	M. S.
Tarafer Islam	Ph.D.
Alvaro Posado	Ph.D.
Paulo Silva	Ph.D.
Bunloe Sutharomn	Ph.D.

ABSTRACT

AN ANALYSIS OF COOPERATIVE AGRICULTURAL CREDIT INSTITUTIONS IN INDIA: A CASE STUDY OF THE PRIMARY CREDIT SOCIETIES IN RAJASTHAN

By

Chain Singh Barla

This study had four objectives: First, to explain the concept of adequacy of agricultural credit; second, to review and evaluate the recent progress and financial health of cooperative agricultural credit institutions serving Indian agriculture; third, to examine the adequacy of credit for different categories of farmers, stratified according to size of holdings; and finally, to suggest certain modification in the existing cooperative agricultural credit policy in India.

In addition to the amount of loan, three other criteria were developed to measure the adequacy of credit in a farm situation: rate of interest, terms and conditions of loans and timing of loan disbursement and recovery. All policies relating to the supply of agricultural credit need to consider these criteria.

Since 1951 government has spent over Rs. 2,000 million for the development of cooperative agricultural credit institutions in India. In addition, generous loans have been provided by the Reserve Bank of India to cooperative credit

institutions. As a result, the supply of short term and medium term cooperative credit increased from Rs. 220 million in 1951-52 to Rs. 5,780 million in 1970-71. By the end of the Fourth Five-Year Plan (1973-74) and the Fifth Five-Year Plan (1978-79) cooperative agricultural institutions are expected to raise the levels of their credit to Rs. 7,500 million and Rs. 12,500 million, respectively.

However, no serious thoughts have been given during the past two decades to improving the terms and conditions of cooperative short and medium term credit and to improving the efficiency of cooperative personnel. Due to a mounting number and amount of overdue loans, cooperative agricultural credit institutions are generally facing a financial crisis throughout the country. The situation seems more critical in a few states such as Rajasthan, Assam, West Bengal and Bihar.

An intensive analysis of the financial health and operational behavior of the primary credit societies showed that most societies in Rajasthan are in a deplorable financial condition. Overdue loans of these agencies have absorbed not only their share of capital but have also eroded a sizeable part of the capital borrowed from the district central cooperative banks.

In order to measure the adequacy of cooperative agricultural credit at the farm level, a random sample survey of 161 farm households was conducted in the district of Jhalawar in

Rajasthan. It was empirically shown that the marginal value product (MVP) of purchased inputs was very much higher than that of the farm grown inputs. Conversely, the MVP of labor was close to zero or negative.

Cross section analysis revealed that unless technological improvements are introduced, an increased supply of credit may imply a wasteful use of capital on small farms (having less than 2.5 hectares). On the other hand, under the existing state of technology, availability of more credit will help medium farmers (having 2.51 to 6.00 hectares) optimize the use of capital. Thus, technology is a constraint on small farms, whereas credit is relatively more, critical on medium size farms.

In view of the inter-regional and inter-farm variations in climate, soil and other factors prevailing in India, a case for regional credit policy was developed in this study. If cooperatives are preferred to other agencies for supplying additional credit to farmers, they need to provide credit at the terms and conditions which are suitable to farmers as well as to their own health. The present magnitude of overdue cooperative loans has plunged cooperatives into a financial crisis. Setting targets for the supply of agricultural credit through cooperatives requires simultaneous steps to reduce the incidence of overdues. Suitable measures are also required to strengthen the capital base of cooperative agricultural credit institutions and to improve the efficiency of cooperative personnel.

ABSTRACT

A MECHANIZED CORN PROJECT IN COSTA RICA: A CASE ANALYSIS

By

Thomas M. Dickey

In the fall of 1971, the Ministry of Agriculture of Costa Rica, in coordination with two other governmental agencies, initiated a small development project for the introduction of mechanization and modern inputs into the cultivation of corn by small farmers near the town of La Fortuna. The development efforts of many countries involve many projects of this size. Such small projects rarely receive much evaluation or analysis even though they constitute a large portion of a government's effort when aggregated. The objective of this study was to present an evaluation framework for use by development institutions which have large numbers of small projects and to use the framework in the evaluation of the La Fortuna project. The evaluation framework concentrates on the effects of a project that generally are not listed as project objectives. The project objectives are usually considered if some evaluation is made. The Side-Effect Evaluation Framework may be used either rigorously (in a written form) or loosely (just by thinking through it; either way, the agency official gains

Thomas M. Dickey

an understanding of the meaning of each side-effect. The framework involves answering the following questions.

1. Identify and Describe the side-effect.
2. Determine the Incidence of the effect.
3. For each person or group listed in Step 2, estimate the potential duration of the effect.
4. For each person or group listed in Step 2, judge whether it is a bad or a good effect and also judge how good or how bad it is (a) taken by itself and (b) taken in conjunction with the other effects of the project.
5. Determine what aspects of the project, in conjunction with the social and economic context of the society, could have caused the effect.
6. (For purposes of evaluating the agency planning ability) Was this effect anticipated or was it a surprise to the agency?

The primary data sources were the small farmer survey which was conducted for the MSU-AID research project and conversations with agency officials in Costa Rica. Secondary data sources included studies performed by the Costa Rica Ministry of Agriculture and by the IICA-AID research team.

The evaluation of the La Fortuna Project produced the following observations:

1. The project did not achieve the listed objectives of increases in per manzana yields or in terms of the area to be planted under the project.
2. The farmers accepted the recommendations of the project as was required, but in the case of fertilizer and herbicide use they reverted to the original low levels of usage, once they left the project. In the case of machinery usage, they reverted from mechanical planting to hand planting, retaining mechanized plowing and disking. The latter effect was probably due to the land clearing operations of the project which made mechanization possible.

3. No conclusions could be drawn considering changes in labor usage. Although the overall average manzana labor requirements did show a significant decline, the negative correlation between unit labor requirements and area planted to corn by farmer produced a large variance in the individual farmer's average labor requirements per unit of area.
4. A few special opportunities for individuals resulted from the project, although little resentment by the other farmers was perceived through the interviews.
5. The data suggest that the farmers in the project now have a significantly lower level of confidence in the institutions involved in the project. Based on this result and on the impressions received from the interviews, a relationship is suggested between past institutional performance and current levels of farmer confidence in the institution. The importance of this relationship results from the role of a farmer's confidence in an institution in his decision to adopt the innovations recommended to him by the institution.
6. Possible factors in the results of the La Fortuna project are listed, although direct causes can not be established. These include (a) low operating standards and poor planning, (b) the project monitoring and evaluation systems of the institutions, (c) the personalities involved, (d) the weather and (e) the input supply system.

Although the simple documentation of a project's successes and failures does not answer the questions of how the failures can be avoided and how the successes can be enlarged, it hopefully narrows the range of aspects through which to search. This is the essence of the Side-Effect Evaluation Framework which is presented.

10/98

ALTERNATIVE LOW-LIFT PUMP IRRIGATION
POLICIES IN BANGLADESH: AN ECONOMIC
AND FINANCIAL ANALYSIS

By

Tarafder Rabiul Islam

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
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DOCTOR OF PHILOSOPHY

Department of Agricultural Economics

1973

ABSTRACT

LOW-LIFT IRRIGATION POLICIES IN BANGLADESH: AN ECONOMIC AND FINANCIAL ANALYSIS

By

Tarafder Rabiul Islam

Low-lift pump irrigation constitutes 79 percent of the total irrigation in Bangladesh. Important characteristics of low-lift pump irrigation are the use of pumps, mostly in one season, a small command area per installed pump, and a heavy subsidy. These characteristics have important implications for individual farm irrigators and the economy. The purpose of this study was to evaluate the economics of alternative low-lift pump irrigation policies from the standpoint of farmers and the economy. The alternatives considered were: 1) the use of low-lift pump irrigation in (a) the Boro season only, (b) the Aus and Aman seasons, and (c) the Boro, Aus, and Aman seasons; 2) three levels of rental charge; and 3) three levels of command area per pump.

To evaluate the above alternatives, the methodology included: 1) developing of estimates for a 'typical' farm by synthesizing data available from published and unpublished

sources; 2) using the modified Penman formula to develop estimates of irrigation requirements; 3) applying linear programming techniques to determine net returns to fixed farm resources, optimum cropping patterns, marginal value products, and amounts of hired labor and bullock power required; and 4) measuring the returns to irrigation by calculating internal rates of return, net present values, and benefit/cost ratios.

The results of the programming model indicated that there would be substantial specialization of crops under irrigated conditions. With irrigation, IRRI aus rice seemed to have the competitive edge over jute. Unless the yield of jute at current prices is increased considerably, jute would be replaced on many farms by IRRI aus rice. The competitiveness of both pulses and oilseeds relative to boro rice and potatoes diminished greatly under irrigated conditions.

The profitability of low-lift pump irrigation from the farmers' standpoint was high for each of the three seasonal alternatives. Contrary to widely held views, the farmers' return to irrigation was higher in the Aus and Aman seasons together than in the Boro season. Farmers' returns from irrigation were only slightly affected by changes in rental charges and the command area per pump. However, their returns were highly sensitive to changes in the yield and price of outputs, but almost insensitive to changes in relevant irrigation requirements and interest costs.

Similarly, the return to irrigation from the point of view of the economy was high for each of the three seasonal alternatives. And the return to irrigation in the Aus and Aman seasons was almost as high as in the Boro season. The profitability of irrigation from the national standpoint was highly sensitive to changes in the command area per pump. Also, changes in yield and price of output influenced greatly this profitability of irrigation.

Several important policy implications emerge from this study. First, the government should place heavy emphasis on the year-round irrigation in areas having surface water throughout the year. Second, low-lift pump irrigation may be expanded substantially by expanding pump use to the Aus and Aman seasons. Third, the existing level of subsidy may be substantially reduced without any significant adverse effect on farmers' incentive. Fourth, national returns from investment in low-lift pump irrigation may be increased considerably by increasing the command area per pump. A package policy combining rental charges, credit, the supply of pumps, and other inputs would be required to effect a significant increase in the command area per pump.

Major research needs highlighted by this study include: 1) analysis of how relative prices and other policies affect jute and IRRI aus rice; 2) micro level studies on farmers' fields to determine water response functions and

optimum irrigation water requirements; 3) research to bring about technological breakthrough in seed, especially for jute, pulses, and oilseeds, so as to make these crops more competitive with rice and generally more productive; and 4) research to shorten the maturity period of important crops, so as to increase cropping intensity.

10/91

A SIMULATION ANALYSIS OF POLICIES FOR THE
NORTHERN COLOMBIA BEEF CATTLE INDUSTRY

By

Alvaro Posada

AN ABSTRACT OF A DISSERTATION

Submitted to
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Department of Agricultural Economics

1974

ABSTRACT

A SIMULATION ANALYSIS OF POLICIES FOR THE NORTHERN COLOMBIA BEEF CATTLE INDUSTRY

By

Alvaro Posada

The Atlantic Coast of northern Colombia (known as the Costa) supports between 40 and 50 percent of Colombia's cattle population and, with easy access to domestic and world markets, is the most important of Colombia's five beef-producing regions. Because cattle raising is the main economic activity in the Costa and is an extensive operation with low technical efficiency, the region has been a priority target for cattle development programs. In the mid-1960s, with the financial and technical assistance of several international agencies, the Colombian government started a cattle development program aimed at increasing beef production mainly on the Atlantic Coast. In the early 1970s this program was reinforced with a disease control program and then revised and issued as a national cattle development plan. The main instruments of this plan are credit, technical assistance, export subsidies and improved marketing and slaughtering facilities. Its long-term objectives are to increase the protein supply to the Colombian population and to generate foreign exchange earnings.

The primary purpose of this study was to develop a system simulation model to (1) analyze the effects of production incentives on the decision of farmers to adopt new production methods, and (2) estimate the effects of the expanded regional production on the income of farmers, government revenues, Colombian beef consumption and sustained level of exports. Four alternatives to traditional production were considered. Alternative 1 considered the improvement of native and artificial grasses; alternative 2 considered the improvement of artificial grasses and the substitution of artificial for native grasses; alternatives 3 and 4 added the production of forages and silage to the improvement of range lands in alternatives 1 and 2 respectively. At the present stage of the study, however, alternative 2 was the only one comprehensively tested and used as a base run for policy experimentation. The cattle system simulation model has five major components (including a cattle demography model) which (1) allocate land use according to the farmer's perceived profitabilities of cattle and crops subject to land and capital constraints; (2) calculate yield and output of cattle and crops and their respective producer and market prices; (3) provide the instrumental linkages for government revenue, export trade policies, and production campaign policies; and (4) generate the performance criteria necessary to evaluate the impacts of alternative programs on the cattle economy through time.

The five major sets of assumptions investigated were (1) disease control in the traditional herd, (2) alternative cattle industry taxing policies, (3) alternative development credit policies, (4) alternative levels of government production campaign promotion, and (5) alternative cattle pricing and export policies. The results of the cattle policy experiments were discussed in terms of the projected time paths (from 1966 to 1985) of five of the most important performance indices incorporated in the model: (1) regional cattle population, (2) Colombian beef consumption per capita, (3) regional farm income from cattle, (4) capitalized grazing land value per hectare, and (5) annual regional government revenue from cattle. Experiments with disease control and export promotion policies each used two indices instead of the above five: regional cattle population and extraction ratio for the disease control policies and domestic market price of finished males and export margin for the export policies.

In general, the study demonstrated that (1) the projected outcomes with the government disease control campaign were greater than under precampaign practices in the traditional herd; (2) the projected outcomes with government programs easing development loan terms were in all cases greater than the base run which assumed current credit policies; (3) the projected area in improved land and the modern cattle population with government policies benefiting both the traditional and modern operations were in all cases lower than under policies benefiting only the modern

Alvaro Posada

operation; (4) the projected area in improved land with the increased land tax rate was greater than the base run which assumed current land tax rates; (5) the projected outcomes with the removal of special taxes on cattle were lower than the base run which assumed no removal of these taxes; (6) given the assumptions on farmers' decisions and accounting mechanisms in the model, availability of credit for land improvement does not seem to be a serious constraint to land modernization; and (7) the projected outcomes with a flexible exchange rate suggest that this is an effective incentive to export without involving large transfers from public revenues to exporters in the form of subsidies.

The study indicated areas where more research and regional data are needed to improve the model's performance, and discussed possible extensions that could help analyze more fully alternative policy strategies for the Costa's overall development. Finally, the study demonstrated that the system simulation approach with a computerized model of the cattle economy which incorporated information from diverse sources and accounted explicitly for the dynamic interactions and feedbacks that might occur can be a very useful methodological tool for policy analysis.

ABSTRACT

ESTIMATING LEAST COST HUMAN DIETS IN THE NORTHEAST OF BRAZIL WITH STOCHASTIC PROGRAMMING--THEORETICAL ISSUES AND POLICY IMPLICATIONS

By

Paulo Roberto Silva

Malnutrition has been the major concern of many nutritionists, economists and public administrators involved in national planning and economic development in less-developed countries (LDC's). An overall approach to the problem usually requires resources and disciplinary skills probably beyond the stocks available in those countries. The approach has been to attack it under different methodologies and perspectives. This study was designed primarily to investigate the extent to which limited purchasing power has prevented consumers in the northeast of Brazil from meeting their minimum nutritional requirements. Therefore, least cost diets meeting minimum levels of nutritional allowances were computed and compared with the actual food expenditures and income patterns. In addition, attempts were made to relate some populations characteristic with the total cost of nutrition as well as to indicate least cost

substitutions, the most expensive nutrients, and the marginal efficiency of particular foods.

Deterministic and stochastic linear programming were used to determine least cost diets that would meet the minimum levels of nutritional allowances suggested by the Institute of Nutrition at Federal University of Pernambuco (INUFPe). The eligible commodities for the least cost diets were mostly traditional foods and their prices were average retail prices for November, 1973 in the two cities studied. Standard families in Recife and Fortaleza were the basic consumption units. Basically, all the least cost diets fell into the purely nutritional category, that is: no conventional restraints were required and they were designed to provide a list of the least expensive nutrients and most efficient combination of foods for meeting nutritional needs.

Minimum allowances for animal protein (about 45 percent of the total protein in the diet) were imposed and the caloric level was additionally constrained by lower and upper bounds. In addition, the amounts of B vitamins (thiamin, riboflavin and niacin) were required to be a proportion of the total calories in the diet. Formally, there were not specific required amounts for the eight essential amino acids, but excesses of each were provided and compared with the minimum standards suggested by FAO. Experimentally, constraints were set

up to explicitly account for conventional habits and people's tastes and preferences.

It was found that actual incomes are adequate to provide standard families in the cities studied with minimum nutritional requirements. In addition, there are indications that those families are inefficient in the purchase of nutrition and that reallocation of the actual food expenditures would improve both their economical and nutritional status. Actual and least cost diets differ primarily in terms of variety, costs, and relative importance of the individual commodities and food groups to the total costs and caloric/protein content. Economic substitutions between traditional and nontraditional commodities were feasible and lowered the cost of nutrition in one of the cities studied (Fortaleza).

The family composition effect on the total cost and food composition of the diets was found to be quite significant, especially for those concerned with pregnancy and lactancy. The family size effect merely shows that large families are more costly to feed than the small ones and that in such diets, by doubling or reducing the family size by a half, the total costs of nutrition should be doubled or reduced proportionally.

The marginal cost of the nutrients obtained as a routine part of the linear programming solution

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indicated that although all nutrients are equally important in satisfying minimum nutritional requirements, they are not equally costly. Such marginal cost figures were highly sensitive to the market prices of the commodities in the least cost diets and the computational procedures used (deterministic and stochastic). In the overall, proteins (both animal and vegetable) were costly nutrients while fat, phosphorous, and thiamin (B-vitamin) were costless at the margin in all least cost diets calculated for the two cities studied. In the aggregate, protein accounts for the greatest amount of total expenditure on food and is followed by calories associated with the B vitamins. The other nutrients together (calcium, vitamin A and C and iron) shared a small percentage of the total food expenditure as shown by the least cost diets.

The marginal efficiency of the foods, as given by the aggregate monetary value of the nutrients in the foods divided by their market prices, were found to be 100 percent for milk, manioc-flour and sweet potato-yellow in all least cost diets. Rice (in Fortaleza) and corn meal (in Recife) also had a marginal efficiency of 100 percent.

In another routine part of the linear programming solution was indicated the range over which the price of the efficient foods (that is, foods which have a marginal

Paulo Roberto Silva

efficiency of 100 percent) could vary without being forced out from the least cost diets. Such a range of variability was quite sensitive to the computational procedures used. Foods like sweet potato, dried beef, manioc-flour, orange, rice, milk and beans-mulatinho were the least sensitive to market price variations.

THE EFFECT OF CHANGING AREAS AND
LEVELS OF TECHNOLOGY OF CORN AND COTTON
PRODUCTION ON THE NET FOREIGN EXCHANGE IN THAILAND

By

Bunloe Sutharomn

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ABSTRACT

THE EFFECT OF CHANGING AREAS AND LEVELS OF TECHNOLOGY OF CORN AND COTTON PRODUCTION ON THE NET FOREIGN EXCHANGE IN THAILAND

By

Bunloe Sutharomn

The primary objective of this study was to evaluate the net foreign exchange position of the country with major emphasis on shifting production patterns and technology levels of crop production in Thailand. Five alternative strategies involving shifts in production patterns and technology levels for corn and cotton were evaluated.

To evaluate the alternatives, costs, returns and net returns per rai were calculated based on survey data and related information, then foreign exchange components of inputs were disaggregated to calculate the foreign exchange costs and returns per rai of rice, corn and cotton, then these results were aggregated for a major production zone as a basis for evaluating the alternative strategies.

The results of the analysis showed that shifting cotton area to traditional corn production with a rapid increase in modern corn production would improve farmers' income and net foreign exchange and would be feasible with regard to

current labor supplies in the region. On the other hand, rapid expansion of modern cotton production relative to modern corn production would result in the highest net return for the alternative considered but would not be feasible with current labor supplies. Considering the alternative of rapid expansion of modern corn production leaving cotton areas and technology unchanged, the results indicated the highest net foreign exchange but this alternative also would result in labor shortage. Finally, a compromise alternative with a slow increase of modern corn and cotton production would result in a small increase in total net return and net foreign exchange as well as leaving some labor surplus.

In evaluating these alternatives the approach was to measure the effects on farm earnings and net foreign exchange from strategies which would consider different rates of technological growth and shifts in the production pattern for the major crops under study. The methodology did not include a search for the optimum solution. The "best" solution depends on the weighting of alternative national goals, the time period within which national goals should be fulfilled, and the extent of the national commitment to fulfill these goals.

To the extent that both improved net foreign exchange earnings and improved net earnings for farmers in a production

Bunloe Sutharomn

area suitable for both corn and cotton production are goals of high priority this study is offered to provide tentative guidelines for policy making and for specifying further research.