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ANNUAL REPORT FOR US/AID 211d GRANT, 1970-71

IOWA STATE UNIVERSITY

DEPARTMENT OF ECONOMICS

I. Introduction

The institutional (211d) grant is designed to develop and strengthen the competence of Iowa State University in the area of agricultural and economic development. Since the grant was not made until the end of June 1970, the implementation of certain activities such as the use of 211d funds to support graduate students' relevant research was delayed because of the lead time necessary to recruit and hire qualified research assistants. Consequently, this progress report should be viewed as reflecting work on programs already under way and as providing particular attention to existing or projected activities for which the new grant funds are or will be used.

II. Staff and Faculty Commitment in Graduate Training and Teaching

No new faculty member with primary interest in economic and agricultural development has been added on a permanent basis during the academic year 1970-71 even though an offer was made to an outstanding prospect.

A list of courses presently offered in the area of economic and agricultural development, and international economics and a description of their content are given in Table 1 and Appendix A. It should be noted that at least two developmental courses have been added to the curriculum last year. An important activity in addition to graduate teaching consisted in the supervision of graduate dissertations in various aspects of economic and agricultural development. Professors Christian, Heady, Fletcher, Mayer, Merrill, Sengupta, Timmons, Thorbecke and Van de Wetering have all been involved in supervising M.S. and Ph.D. dissertations in economic and agricultural development. Table 2 provides a list of

Table 1

COURSES IN ECONOMIC DEVELOPMENT, AGRICULTURAL DEVELOPMENT
AND INTERNATIONAL ECONOMICS^{*/}

<u>Course No.</u>	<u>Title</u>	<u>Professor</u>	<u>Enrollment</u>	
			<u>Undergraduate</u>	<u>Graduate</u>
411	Economics of Underdeveloped Nations	Scott	57	1
412	Economics of Agricultural Development		(New Course)	
455	International Economics	Thorbecke, et al.	91	5
456	International Finance	Cheng	32	0
512	Agrarian Reform and Economic Development	Timmons	1	12
535	Economic Development and Transformation of Agriculture	Mayer		
541	Agriculture in the World Economy	Kaldor		
555	Advanced International Economics	Thorbecke		29
557	Advanced International Finance	Cheng		6
570	Economic Development and Growth	Thorbecke		27
571	Economic Development and Growth	Thorbecke-Sengupta	(New Course)	
696A	Theory of Quantitative Economic Policy	Thorbecke		19

^{*/}The course descriptions are given in Appendix A.

Table 2

Graduate Students with Primary Interest in
Economic and Agricultural Development

A. At Pre-dissertation Stage

<u>Name</u>	<u>Country</u>	<u>M.S. or Ph.D. Candidate</u>
David Johnston	U.S.A.	Ph.D.
Fructuoso Caballero	Mexico	Ph.D.
Michael Applegate	U.S.A.	Ph.D.
Yoshihiko Sugai	Brazil	Ph.D.
Marco Pajuelo	Peru	M.S.
Raul Salazar	Peru	M.S.
Gonzalo Aristizabal	Colombia	M.S.
Yie-Lang Chen	Taiwan	M.S.
Juan Hurtado	Peru	M.S.
Sangkom Suwannarat	Thailand	M.S.
Maria Balestrieri	Italy	M.S.
Carlos Bolona	Peru	Ph.D.
Jorge Checkley	Peru	Ph.D.
Sahika Kayir	Turkey	Ph.D.
Daniel Messerschmidt	U.S.A.	Ph.D.
Steven Rottler	U.S.A.	Ph.D.
R. Vaitheswaran	India	Ph.D.
Hugo Zegarra	Peru	Ph.D.
George Abalu	Cameroun	Ph.D.
Won Whe Koo	Korea	Ph.D.
Judy Lu	Taiwan	M.S.
Dafnis Panagides	Cyprus	Ph.D.
Alejandro Seminario	Peru	Ph.D.
Irlan Soejono	Indonesia	M.S.
Ashton Veramallay	Guyana	Ph.D.
Daniel Barrera	Mexico	Ph.D.
	Turkey	Ph.D.

Table 2 Continued.

Chi-Jiau Chen	Taiwan	Ph.D.
S. Chiraponda	Thailand	Ph.D.
Uri Horowitz	Israel	Ph.D.
Chung-Chi Lu	Taiwan	Ph.D.
Chandi Charnon Maji	India	Ph.D.
Anton D. Meister	New Zealand	Ph.D.
Cishnu Prasad Nagadevara	India	Ph.D.
Olabise Ogunfowora	Nigeria	Ph.D.
Edmundo Prantilla	Philippines	Ph.D.
Athanassios Stamatiou	Greece	Ph.D.
Alan Tsao	Taiwan	Ph.D.
George H. Wang	Taiwan	Ph.D.
Lu Ng	Malaysia	Ph.D.
Mark Lund	U.S.A.	Ph.D.

Table 2 Continued.

B. At Dissertation Stage

<u>Name</u>	<u>Country</u>	<u>M.S. or Ph.D. Candidate</u>	<u>Dissertation Topic</u>
Iftikhar Ahmed	Pakistan	Ph.D.	"Unemployment and Underemployment in Pakistan"
Gunars Dambe	U.S.A.	Ph.D.	"Employment Creation in Latin America"
Gabriel Ojo	Nigeria	Ph.D.	"A Macroeconomic Model of Nigeria and the Employment Problem"
J. Stavrou	Panama	Ph.D.	"A Simulation Approach to Development applied to Peru"
Robert Crown	U.S.A.	Ph.D.	"Principles of Programming Aid to Economic Development"
Jerry Fedeler	U.S.A.	Ph.D.	"The Measurement of P.L. 480 Impact Within a General Equilibrium Framework"
* Keith Rogers	U.S.A.	Ph.D.	"Theory and Application of Food Aid in Economic Development"
* Roger Hexem	U.S.A.	Ph.D.	"Factors Affecting the Economic and Social Well-being of Agriculturalists in Less-Developed Areas and Agriculture's Contribution to General Economic Expansion"
* Walter Hassel	U.S.A.	Ph.D.	"A Theoretical Analysis of Intersectoral Relationships in a Five-Sector, Optimizing Model of a Dual Economy"
Miguel Tejada	Peru	Ph.D.	"Experiments with Balance-of-Payments in a Developing Economy: The Peruvian Experience, 1945-71"
Bernardus Muljana	Indonesia	Ph.D.	"Role of Agricultural Exports in Indonesia"
Olumayokun Omatayo Olawoye	Nigeria	Ph.D.	"Nigeria's Economic Development"
Lizardo De las Casas	Peru	Ph.D.	"A Sectoral-Decomposable Macro-economic Programming Model of the Peruvian Economy"
Juan Carlos Martinez	Argentina	Ph.D.	"Induced Innovation and Technical Change in Argentine Agriculture"
Jose T. Mulleady	Argentina	Ph.D.	"Economic Reasibility of Adopting New Technology for Corn Production in Argentina"
Jorge Lopera	Colombia	Ph.D.	"Rural-Urban Interaction in Regional Development in Colombia"

Table 2 Continued.

Javier Galvan	Peru	Ph.D.	"Optimal Exchange Rate Policies for Peru in the Andean Group"
* David Hansen	U.S.A.	Ph.D.	"Identification of Economic Impediments to Utilization of Mexico's Idle Lands and Policy Implications for the Ejido and Private Sectors"
Claudio Pou	Bolivia	Ph.D.	"Optimal Allocation of Agricultural Resources in the Development Area Patacamaya Bolivia: A Parametric Linear Programming Approach"
Nicholas Martinos	Greece	Ph.D.	"Estimation of the Demand and Supply Function in the Farm Sector in Germany, Greece and the U.S.A."
* Carlos Amat y Leon	Peru	M.S.	"Income Analysis of the Demand for Food in Six Peruvian Cities"
* Jose Salaverry Llosa	Peru	Ph.D.	"An Interregional Linear Programming Model for the Analysis of Agricultural Development Policies in Peru"
Jacob Wein	Canada	Ph.D.	"Structural Restraints to Farm Size Adjustment of Canadian Prairie Grain Farms"

* Dissertation Completed During 1970-1971.

the graduate students primarily interested in economic and agricultural development broken down into pre-dissertation and dissertation stage, respectively. For the latter category the dissertation topic is given. Table 2 shows that there were approximately 40 graduate students with primary interest in economic and agricultural development at the pre-dissertation stage during 1970-71; and about 20 students at the dissertation stage (including those who completed their dissertations during the year). Roughly a third of the above graduate students came from Latin America and about one-fifth are from the United States. The bulk of the dissertation topics given in Table 2 fall into three major inter-related themes: (a) employment creation and income distribution; (b) agricultural and economic development problems in Latin America, emphasizing the intrasectoral effects; and (c) analysis of the role of food aid in economic development.

III. International Linkages in Research and Teaching in Economic and Agricultural Development

During the year 1970-71 a number of faculty members in the economic department were engaged in a variety of international activities in the areas of economic and agricultural development. Many of these activities were interrelated in the sense that they had a common research theme. For example, among the most important substantive research areas which were explored are found: unemployment and underemployment, agricultural sector analysis, and intra- and intersectoral relations in the process of development. Given the competence and the interests of staff members at Iowa State University many of these activities were concentrated on Latin America. These latter activities are presented next and followed by a short description of activities relating to other parts of the world.

A. Activities Relating to Latin America

i. Panama: Dr. Randall Hoffmann spent almost two months in the Spring of 1971 working with the USAID Mission and the Panamanian Planning Council in helping to prepare an agricultural sector study. At the end of his stay, Dr. Hoffmann wrote a report on agricultural demand and supply projection. Dr. Hoffmann's assignment was arranged through the Latin American Bureau and TAB under the talent-sharing part of the 211d grant. After completing his initial assignment, Dr. Hoffmann was invited to return to Panama to continue work on the agricultural sector study for one full year starting in June of 1971. Professor Hoffmann's present appointment was also worked out as part of the talent-sharing arrangement.

ii. Uruguay: Professors Fletcher and Merrill completed an analysis of the agricultural sector which was sponsored by the Inter-American Development Bank. (See Inter-American Development Bank, "Uruguay's Agricultural Sector: Priorities for Policies, Investment Programs and Projects", Papers on Agricultural Development No. 9, July 1970) During 1970-71, Dr. Fletcher provided short-term advisory services to US/AID and the Government of Uruguay on marketing problems and need for research and institutional development. He also initiated research on Uruguay's national accounts and intersectoral production structure. One of his findings was that labor productivity is higher in agriculture than in other sectors when sectoral outputs are valued at world market prices. The results of his research are being described in a manuscript titled, "Structural Over-transformation: Labor Productivity in Uruguay".

iii. Guatemala: Professors Fletcher and Merrill worked with the National Planning Council and the AID Mission on agricultural development priorities and

programs. A special report, "Vegetable Production and Marketing in Guatemala" was completed in the spring of 1971 which analyzed the potential contribution of crop diversification to agriculture income and employment in the Highlands. Furthermore the paper on the evaluation of the government's rural development program was prepared for the Planning Council. This paper was based in part on the thorough sector analysis which had been prepared previously for USAID by Fletcher, Graber, Merrill and Thorbecke (The Role of Agriculture in Guatemala's Economic Development, Iowa State University Press, 1970).

iv. Mexico: Professor Donald Winkelmann was on a leave of absence during 1970-71 working with the Ford Foundation in Mexico. His main function was to provide follow-up assistance to the National Agrarian University at Chapingo in the building of a graduate program in agricultural economics and statistics. It should be noted, in this context, that Iowa State University had a team of agricultural economists, economists, and statisticians located at Chapingo to help build the above program during 1965-70 under a Ford grant. Professor Winkelmann was a key member of this team from 1966 to the present.

In the summer of 1971 Professor Merrill worked with the Mexican Ministry of Agriculture on problems relating to production and marketing of wheat, oil seeds and lime oil.

v. Peru: The Iowa-Peru-AID project provides an extremely important linkage with the 211d grant. This Iowa-Peru project was initiated in 1962 and has been continuing ever since. Dr. John Timmons is the Director of the project and Erik Thorbecke is the Associate Director. The overall objectives of the project were to assist in the development of plans by the government of Peru for

the economic and social growth of Peru, with special emphasis on the agricultural sector which in turn would help achieve a significant increase in the standard of living and a more equitable distribution of income among the people. Since the inception of the project, Iowa State University has had a team of economists and lawyers in residence in Peru. (At the present time the Iowa Mission in Peru consists of five long-termers.)

The Iowa Mission has operated in cooperation with a number of Peruvian agencies such as the Agricultural Sectoral Planning Office attached to the Ministry of Agriculture; the Direction of Agricultural Marketing of the Ministry of Agriculture; the National Planning Institute; the National Agrarian University; the Central Reserve Bank; the Ministry of Economics and Finance; the Agrarian Reform Institute; and the National Office for Evaluation of National Resources. Between 1962 and the present, about 40 Peruvian participants were sent to the U. S. and third countries for graduate training (mainly in economics and agricultural economics). Also during the same period, Iowa Mission technicians completed economic and legal studies with various Peruvian agencies resulting in over 40 different publications.

A key member of the Iowa team in Peru during 1969-71 was Professor Hylke Van de Wetering who returned to campus at the beginning of the academic year 1971-72. Among Dr. Van de Wetering's accomplishments might be noted his major role in the preparation of a five-year national agricultural development plan; the preparation of a series of basic economic studies essential to national development planning; the development of a comprehensive programming, budgeting and evaluation procedure within the agricultural sector; and, the organization and training of a research group of technicians (which at one time amounted to as many as 23 individuals) from different agencies such as the National Agrarian

University, the Central Reserve Bank and the Ministry of Agriculture; and the supervision of M.S. and Ph.D. dissertations by Peruvian graduate students. During this last year, Dr. Van de Wetering's research work centered on a thorough study of the implications of the new agrarian reform law as well as the implementation of agricultural planning. He wrote a paper on the implications of the new agrarian reform law which he presented at the International Conference of Agricultural Economists at Minsk in August 1970.

Among the Iowa State faculty members who went to Peru as short-termers last year, were Professor Merrill who consulted with the Peruvian Ministry of Agriculture on marketing studies and Professor Christian who was invited by the Ministry of Economics and Finance to assist it in making projections of economic variables in the process of preparing the Annual Plan.

vi. Research Linkages with International Agencies on Unemployment and Underemployment in Latin America: Professors Sengupta and Thorbecke prepared an invited paper for the Fifth International Conference on Input-Output Techniques in Geneva, January 1971, on "Employment Response in an Input-Output Framework under Technological Change". They continued this line of research in connection with a collaborative project initiated by the Development Research Center of the World Bank on Technical Change and Employment. In this connection they prepared a paper and presented it to a meeting organized by the World Bank in Washington in June 1971. The paper dealt with a detailed analysis of the sectoral employment implications of different policies and assumptions concerning technical change in Colombia. A procedure was also developed to relate the sectoral income distribution to the personal income distribution in Colombia. Work is proceeding on this project.

Dr. Thorbecke was invited by the Inter-American Development Bank to prepare a paper on "Unemployment and Underemployment in Latin America" to be presented at a conference in Santiago, Chile, in November 1970. The conference was organized by IDB and the Latin American Institute for Economic and Social Planning (ILPES) and was attended by social scientists from a large number of Latin American countries. The main theme of the conference was an analysis of the concept of "marginality" looked at from an economic, sociological and political science standpoint.

Professor Thorbecke was also invited to present seminars to the whole staff of the Economic Department of the Organization of American States on "Unemployment and Underemployment in Latin America" in June 1971 and to review the work of OAS economists in this same area.

During 1970-71 Professor Thorbecke and Mr. Gunars Dambe worked closely with the Policy Advisory Bureau of the Food and Agriculture Organization on the employment and income distribution implications of the Prospective Agricultural Development Study FAO is presently engaged in. In this connection, Mr. Dambe spent two months in Guatemala working with an FAO regional team (GAFICA) on the employment implications of economic integration within Central America. Professor Thorbecke and Mr. Dambe worked, furthermore, in Rome on the development of a methodology to derive consistent agricultural projections under technological change within the context of overall economic growth and alternative income distributions. A paper on this question prepared by Erik Thorbecke was published by FAO in July 1971. This methodology is now being applied to Colombia, Peru, and a few other Latin American countries.

B. Selective Activities Outside of Latin America

1. Indonesia: Professor Geoffrey Shepherd spent most of the academic year 1970-71 in Indonesia preparing a detailed study of rice marketing under

a contract with USAID and Weitz-Hettlesater Company. Professors Merrill and Timmons also provided some assistance to this project.

ii. Tunisia: Professor Thorbecke was invited to give a series of lectures and seminars on economic and agricultural development to the faculty of economics of the University of Tunis during February-March 1971. He also provided technical assistance to a number of economists associated with the Tunisian Economic and Social Research Center. His visit was under the sponsorship of the University of Minnesota team in Tunisia and USAID-Tunisia.

IV. Special Seminars and Programs

A. Related to the Agricultural Development Council Research Training Network

Dr. Thorbecke was asked to organize a Conference on Agricultural Sector Analysis and Planning by the Agricultural Development Council as part of the latter's Research Training Network. This conference was held at Iowa State University on May 17 and 18. The main purpose of the conference was to bring together researchers in the area of agricultural sectoral analysis and representatives of bilateral and multi-lateral aid agencies which use sector analysis for planning and policy purposes. Four major agricultural sector analyses were presented: (1) a linear programming model of Mexican agriculture, by J. Duloy and R. Norton of the World Bank; (2) a recursive programming model of Punjab agriculture, by Richard Day and associates; (3) a simulation model of Nigerian agriculture, by Glenn Johnson and colleagues; and (4) a sector analysis of Guatemala, by L. Fletcher, W. Merrill, and E. Thorbecke. In addition, a valuable feature of the conference was provided by the contributions made by a users' panel consisting of representatives of AID, the World Bank, the Organization of American States, the Indian Planning Commission, and the Food and Agriculture Organization. This users' panel addressed itself to the criteria which

sector analysis should fulfill to be useful to policymakers. About 30 participants from universities, bilateral and multilateral agencies, and foundations attended the conference. A copy of the program and list of participants is attached in Appendix B. (Copies of the papers can be obtained from E. Thorbecke.)

Professor Fletcher chaired two workshops on agricultural marketing and price policies in developing countries which were again under the sponsorship of the Agricultural Development Council. Professor Merrill participated in one of these seminars. Finally, Dr. Thorbecke participated in an ADC seminar chaired by Professor Tolley at the University of Chicago on "International Trade Policies and Economic and Agricultural Development" in May 1971.

B. Employment-Development Seminar Within the Economics Department

Doctors Thorbecke and Sengupta organized a seminar on employment and income distribution implications of economic development under technological change. For about four months weekly Saturday morning meetings were held which permitted an intensive interchange of ideas within a small group consisting of the above mentioned in addition to Drs. Fox, and Fletcher and a group of about six graduate students at the dissertation stage. A list of specific topics and papers discussed at this seminar is available upon request.

V. Research Publications and Reports

Table 3 contains a list of relevant publications and reports in topics related to the scope of the 211d grant which were completed during the year 1970-71. It can be seen that the bulk of these publications falls into the following categories: (a) unemployment, underemployment and income distribution studies; (b) specific agricultural sector analyses of different Latin American countries leading to policy recommendations for agricultural development and planning; and, (c) land tenure

Table 3

RELEVANT PUBLICATIONS AND REPORTS

- Christian, James, "Análisis Macro-Sectorial de la Economía Panameña", in Estudios Sobre el Sistema Monetario y Bancario de Panamá y Otros Problemas Sociales, Estudios Especiales No. 2 de la Dirección General de Planificación de la República de Panamá, June 1970.
- Christian, James, "Domestic Financial Markets in Developing Economies: A Theoretical and Empirical Analysis," with Emiliós Pagoulatos, June 1971.
- Fletcher, L., Graber, E., Merrill, W., and Thorbecke, E., Guatemala's Economic Development: The Role of Agriculture, Iowa State University Press, Ames, 1970.
- Fletcher, L., and Merrill, W., "Product Markets: A Discussion," in Institutions in Agricultural Development, Melvin G. Blase, ed., Iowa State University Press, Ames, 1971.
- Fletcher, L., "Low Investment Levels in Uruguayan Agriculture: A Comment", in Land Economics, February 1971.
- Fletcher, L., Inter-American Development Bank, "Uruguay's Agricultural Sector: Priorities for Policies, Investment Programs and Projects," Papers on Agricultural Development No. 9, July 1970.
- Hoffmann, Randall, "Agricultural Sector Report, report prepared for USAID Panama, June 1971.
- Merrill, W., Fletcher, L., and Hanrahan, M., Vegetable Production and Marketing in Guatemala, USAID-Guatemala Report, 1971.
- Sengupta, J. K., and Thorbecke, E., "Employment Response in an Input-Output Framework Under Technological Change", paper prepared for the Fifth International Conference on Input-Output Techniques, Geneva, January 11-15, 1971.
- Sengupta, J. K., Thorbecke, E., "Consistency Model Analyzing Sectoral Employment in an Input-Output Framework under Technological Change", paper prepared for the Development Research Center of the International Bank for Reconstruction and Development, May 1971.
- Thorbecke, E., "The World Food Problem: World Famine or Food Surpluses by 1980?", Journal of International Affairs, Vol. XXIV, 1970.
- Thorbecke, E., "Unemployment and Underemployment in the Developing World", testimony before the Foreign Economic Policy Subcommittee of the Joint Economic Committee of Congress, May 1970 (in A Foreign Economic Policy for the 1970's, Hearings before the Subcommittee on Foreign Economic Policy of the Joint Economic Committee, May 1970), pp. 704-719.
- Thorbecke, E., "Unemployment and Underemployment in the Developing World", in Barbara Ward, et al., editors, The Widening Gap, Development in the 1970's, Columbia University Press, 1971.
- Thorbecke, E., and Stoutjesdijk, A., Employment and Output, A Methodology Applied to Peru and Guatemala (Organization for Economic Cooperation and Development, Development Centre, Paris, 1970).

Table 3 Continued.

- Thorbecke, E., Comments on "The Argentine State and Economic Growth: A Historical Review", by Carlos F. Diaz Alejandro in G. Ranis, ed., Government and Economic Development (Yale University Press, New Haven, 1971).
- Thorbecke, E., "What is Unemployment?", CERES FAO Review, Nov.-Dec., 1970.
- Thorbecke, E., "A Methodology to Derive Consistent Agricultural Projections under Technological Change within the Context of Overall Economic Growth and Alternative Economic Distributions", FAO, Policy Advisory Bureau, July 1971.
- Timmons, J.F., "Current Land Reforms in East Pakistan," February 1971, Land Economics, Vol. 47, No. 1, with Iftikhar Ahmed.
- Timmons, J. F., "Managing Natural Resources Through Land Tenure Structures," Jan-Feb. 1971, Journal of Soil and Water Conservation, Vol. 26, No. 1, Journal Paper No. J-6659 of the Iowa Agr. and H. Ec. Expt. Sta., with J. M. Cormack.
- Timmons, J. F., "World Farm Tenancy", Encyclopedia Britannica, 1970, rev. ed.
- Van de Wetering, H., "A First Measurement of the Rate of Unemployment of the Peruvian Agricultural Labor Force", (paper presented at the L.A. regional meeting of the Ford Foundation, Caracas, May 1971).
- Van de Wetering, H., "The Potential Impact of Peruvian Agrarian Reform Law 17716 on Agricultural and Non-agricultural Productivity" (working document Iowa Mission).

and water resources studies. It should be noted that a large number of specific studies on various aspects of Peruvian agricultural development and planning were completed under the Iowa-Peru project. These publications are not listed here except for a couple of exceptions. A complete list of the publications done under the Iowa-Peru program are available upon request.

In addition to the publications by faculty members listed in Table 3 there are a number of dissertations in process dealing directly with problems central to the research scope of the present 211d grant. (See Table 2.B. for list of dissertations.)

VI. Plan of Work

As the attached financial report indicates, the total expenditures from the 211d grant during 1970-71 were quite low. This reflected basically the very late date (June 24, 1970) Iowa State University was notified that the final grant had come through, and a conservative funding program in prior years so that commitments for research and graduate student support for this past year had already been made from other sources by June 1970.

Presently four graduate students are budgeted to the 211d grant. All four are about to embark on Ph.D. research topics. Messrs. Michael Applegate, Daniel Messerschmidt, and Steven Rottler will concentrate on various aspects of employment and income distribution in Latin America. Their research will emphasize particularly the effects of technological change on input requirements within agriculture including the employment effects and the derived income distribution implications. They will also look at sectoral employment implications and the rural-urban migration. It is hoped that specific policy recommendations will be forthcoming from these theses. Mr. Lu Ng (a Malaysian citizen) will concentrate

his work on the choice of technique available at the sector level and as between sectors (e.g., to what extent the intersectoral input-output relations can be altered). He will also look at the determinants of changes in labor productivity in agriculture and other sectors and the effects of different production techniques on agricultural output and employment.

In addition to the four individuals named above, it is anticipated that about three additional dissertation-stage graduate students will be provided 211d half-time research assistantships during the academic year 1971-72.

A normal pattern of operations for a dissertation-stage student financed under the 211d grant, who intends to do part of his research abroad might be (a) to spend three months on campus, working out the detailed conceptual outline of the thesis in cooperation with his major professor; (b) to present this conceptual outline to the 211d departmental committee at the end of the three month period for its evaluation; (c) to spend a year abroad gathering information and doing research; and (d) to return to campus to complete the writing of the dissertation over the next nine months.

A committee consisting of Erik Thorbecke, Project Director; John Timmons, Associate Project Director; and Lehman Fletcher is in charge of administering the grant. One of the major tasks of this committee is to insure that the scope of the research projects financed under the grant are well-integrated and consistent with the aims of the 211d grant.

Two Iowa State faculty members, Dr. Randall Hoffmann and Dr. Frederick Mann, will be on leaves of absence during 1971-72 under the talent-sharing part of the program. As was pointed out previously, Dr. Hoffmann will be spending the year in Panama undertaking work on an agricultural sector study with USAID-Panama

and the Panamanian government. Dr. Fred Mann, who until the summer of 1971 was the Chief of Party of the Iowa Mission in Peru, will be working in TAB/AID Washington. He will concentrate on water resources and land tenure and title problems.

An attempt will be made this coming year to recruit a new faculty member in economic and agricultural development to be supported under the 211d grant. This individual would strengthen our teaching and research capacity and would be potentially available for a future tour of duty with AID. The research work under the 211d grant will be concentrated mainly on employment, income distribution, and intrasectoral relationships in the process of development as well as water resources. Furthermore, much of the applied work will be directed toward Latin America.

Appendix A

Courses Relating to Economic and Agricultural Development, and International Economics

Economics of Underdeveloped Nations (Cr. 3)

Analysis of capital formation and capital allocation problems; relation of transportation, communications, and resource availability to development; population and education problems as they relate to growth.

Economics of Agricultural Development (Cr. 3)

Less-developed economies; share and role of agriculture in labor force and national income; structure of agriculture; subsistence and commercial sectors; population, food, and nutrition; institutional considerations; policies for development; aid and international trade.

International Economics (Cr. 3)

Principles of international trade, exchange rates, and balance of payments adjustments. Commercial and foreign investment policies. Foreign trade and American agriculture and industry.

International Finance (Cr. 3)

Methods of financing international trade. The foreign exchange and the gold standard. International financial institutions, short- and long-term capital movements, and problems of international liquidity.

Economic Development and Transformation of Agriculture (Cr. 3)(E. O. Heady)

Relation of economic growth to factor prices and the technological and firm structure; firm behavior and aggregate response in product supply and factor demand; developmental needs for transformation of agriculture and resource mobility; supply and resource problems under different stages of development; policy needs for alternative problems in development.

Agriculture in the World Economy (Cr. 3) (D. Kaldor)

International comparison of development, adaptation, instability, and income problems in agriculture; world agricultural specialization and trade; policies of food importing and exporting nations and role of national and international agencies in agricultural development.

Advanced International Economics (Cr. 3) (H. S. Cheng, E. Thorbecke)

Modern theory of international pricing and allocation; foreign trade multiplier and international monetary equilibrium; problems of international economic stability; multilateral trade and economic development.

Advanced International Finance (Cr. 3) (H. S. Cheng)

Theory of foreign exchange, mechanism of adjustments in the balance of payments, exchange speculation and the forward exchange market, selected topics in international monetary policy.

Economic Development and Growth (Cr. 3) (E. Thorbecke, J. K. Sengupta,
H. Van de Wetering)

Determinants of economic development, development planning models, and conflicts between development objectives. Applications of economic development theory to concrete situations at the national, sectoral, and regional levels. Empirical case studies. Choice of technique in development.

Theory of Quantitative Economic Policy (Cr. 3) (J. K. Sengupta, E. Thorbecke,
H. Van de Wetering)

Formulation and specification of policy models applied to problems of economic stabilization and economic development, mainly at the national level. Economic forecasting and reliability analysis for economic policy models. Economic policy models and the theory of optimal control. Specification and computation of optimum policy dynamic economic models. Certainty equivalence theorem and decision rules. Continuous and discrete versions of the maximum principle and their economic applications to growth, stabilization, and other problems. Economic policy models at the sectoral level. Sectoral planning applied to agriculture, transportation, education and other sectors. Changes in technology and their effects on sectoral objectives.

Appendix B

PROGRAM AND SCHEDULE

ADC CONFERENCE ON
AGRICULTURAL SECTOR ANALYSIS AND PLANNING

May 17 and 18, 1971
Gallery Room, Memorial Union
Iowa State University
Ames, Iowa

Monday, May 17 - Morning Session (9:00 A.M. - 12:00 noon)

Welcome and Brief Description of ADC's Research Training Network

Wayne Schutjer, Agricultural Development Council

Purposes and Plans of Conference

Erik Thorbecke, Iowa State University

What do bilateral and multilateral aid agencies look for in sector analysis? A users' panel.

Arthur Coutu (AID)
Nicholas Ardito Barletta or Conrad Gislason (OAS)
Henri Quaix (FAO)
Bhim Mahajan (FAO)
S. R. Sen (IBRD)

Monday, May 17 - Afternoon Session (1:30 - 5:00 P.M.)

Chairman: Richard Day, University of Wisconsin

Case Studies of Sector Analyses

1. A Systems, Simulation Approach

A Computerized, Systems-Science, Simulation Approach to Agricultural Sector Model Analyses and Applications to Nigeria
(Three papers: No. 1, 2, and 3)

Glenn Johnson and collaborators, Michigan State University

Discussant: George Tolley, University of Chicago

2. A General Equilibrium - Policy Approach

The Role of Agriculture in the Economic Development of Guatemala

Lehman Fletcher, William Merrill, Erik Thorbecke
Iowa State University

Discussant: Albert Berry, Yale University

Tuesday, May 18 - Morning Session (9:00 A.M. - 12:00 noon)

Chairman: Arthur Coutu (AID)

3. A Comprehensive Linear Programming Approach with Explicit Linkages to
Districts within Agriculture and to the Rest of the Economy

A Programming Model of the Agricultural Sector of Mexico

John Duloy, Roger Norton (IBRD)

Discussant: Clark W. Reynolds, Stanford University

4. A Linear Programming Approach Applied to a Region

A Recursive Programming Analysis of Agricultural Development in
the Punjab

Richard Day, Mohinder Mudahar - University of Wisconsin
I. J. Singh - Ohio State University

Discussant: S. S. Johl, Ohio State University

Tuesday, May 18 - Afternoon Session (1:30 P.M. - 4:00 P.M.)

Chairman: Lehman Fletcher, Iowa State University

Comparative Evaluation and Operational Relevance of Sector Analysis

Erik Thorbecke, Iowa State University

Identification of Future Research Areas and Possible Follow-up Plans

DC CONFERENCE ON AGRICULTURAL SECTOR ANALYSIS AND PLANNING

Iowa State University

May 17-18, 1971

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