

AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523
BIBLIOGRAPHIC INPUT SHEET

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BATCH #28

1. SUBJECT
CLASSI-
FICATION

A. PRIMARY

Serials

Y-AF10-0000-0000

B. SECONDARY

Agriculture--Agricultural economics

2. TITLE AND SUBTITLE

Agricultural economics related to the less developed countries; agreement to increase the capability of Cornell Univ.: annual report 1972/1973

3. AUTHOR(S)

(101) Cornell Univ. Dept. of Agr. Economics

4. DOCUMENT DATE

1973

5. NUMBER OF PAGES

41p.

6. ARC NUMBER

ARC

338.1.C814

7. REFERENCE ORGANIZATION NAME AND ADDRESS

Cornell

8. SUPPLEMENTARY NOTES (Sponsoring Organization, Publisher, Availability)

(Activities summary)

9. ABSTRACT

10. CONTROL NUMBER

PN-RAB-555

11. PRICE OF DOCUMENT

12. DESCRIPTORS

Agricultural economics

13. PROJECT NUMBER

14. CONTRACT NUMBER
CSD-2823 211(d)

15. TYPE OF DOCUMENT

US/AID 211(d) ANNUAL REPORT

CSU-2825 (11d)
338.1.0814

#2823

September 25, 1973

Title: A grant agreement to increase the capability of the New York State College of Agriculture, Cornell University in agricultural economics related to the less developed countries

Grantee: Department of Agricultural Economics, Cornell University

Director: B. F. Stanton

A. Statistical Summary:

Period of Grant: 6-24-70 to 6-23-75 Amount of Grant: \$240,000.00
Expenditures for Report Year: \$27,585 Accumulated: \$69,720
Anticipated for next year: \$80,000

B. Narrative Summary:

The 211(d) grant for work in agricultural economics at Cornell University has made possible an expanded graduate teaching and research program concerned with applied economic problems in agricultural development. Primary emphasis has been placed on developing more substantial programs on agricultural markets and market systems, international trade and comparative advantage. This supplements and complements existing strength and work in production economics, land tenure issues, price policy, evaluation of new technology and sector analysis with particular reference to employment and income distribution.

Funds have been used during the past fiscal year to support overseas research by faculty and graduate students in Indonesia, Iran, and Uganda. A series of three new projects have been developed by Professor Sisler and his students associated with problems in developing markets and creating trade potential in Nepal. A cooperative research program has been developed with Michigan State University in Northern Nigeria for a doctoral student at Cornell concerned with rural employment and income distributions in densely populated areas. Plans are also in process for a cooperative project in the Cameroons prepared by one of Cornell's graduate students to be directed on the field by a faculty member from Southern University located in the Cameroons.

Faculty have made a concerted effort to extend the results of their research and that of their students with professional, academic, and governmental audiences in overseas locations. Professor Forker returned to Turkey for a seminar series and participated in teaching programs for Turkish officials in Washington. Professors Conklin and Freebairn worked on programs in Costa Rica, Peru, and Mexico and interacted with faculty and government officials concerned with agriculture and science policy. Funding for some of their work came from the 211(d) grant in Science, Technology, and Society at Cornell. Professor Poleman consulted extensively with government officials and FAO personnel on food and nutritional planning in Sri Lanka (Ceylon). Professor Mellor presented lectures and seminars at a number of conferences and workshops held at universities in the United States, in Singapore and Washington, D. C. In addition, he presented a series of lectures and seminars in Ethiopia and Nigeria in November 1972.

C. Detailed Report

I. General Background and Purpose of the Grant

This grant was one of six made to land grant universities with substantial interests and commitments to teaching and research on economic problems associated with the process of agricultural development. The intent was to expand and strengthen the competence of resident faculty and programs in these departments so that more substantial capability and capacity could be developed within American universities than might be possible if local or state resources were the primary ones used to support work in this complex and important field. In particular, this grant makes possible a graduate research and teaching program involving significant issues and field studies that can be carried on in developing countries. In this manner, the results of research and study can be applied directly to existing problems. It provides a mechanism for American teachers and scholars to become directly involved with the real problems and issues of development together with their students in the classroom and at specific overseas locations.

II. Objectives of the Grant

1. Objectives Restated

(1) To create a framework within which a significant number of U. S. economists interested in agricultural development in the less developed countries can work cooperatively on certain research problems of urgent importance to these 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 a way which will be helpful to the devel-

oping 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 relate to the agricultural sector and the relationship 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 experience 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.

2. Review of Objectives

Contributions have been made to each of the four objectives since the grant was instituted. Primary emphasis has been given to the first three objectives with particular emphasis on research and graduate teaching for students concerned with problems in the less developed countries. Training of graduate students from a wide range of backgrounds and different countries and then involvement of these students in significant research programs within developing countries is central to our function and mission. This grant has broadened the horizons

of a number of our faculty who had not previously been involved with overseas programs. Every graduate student and faculty research project has been developed cooperatively with professionals overseas and monitored by them along with our faculty. Where appropriate, US/AID officials or national government representatives have been involved in the various stages of field research and recommendations growing out of the studies. Such interaction is particularly important if research results are to be used and students doing the research are to become an integral part of research and administrative agencies in their own countries.

In this manner, the competence of our faculty to work with development oriented research has been increased both through teaching and field experience. The program has strengthened teaching at the graduate level, increased our capacity to identify meaningful problems for continuing research and increased our interaction with faculty at the other 211(d) institutions in the United States as well as faculty and research workers in the developing countries.

This grant has enhanced the capacity of our faculty and department to support and complement work associated with US/AID contract, c.s.d. 2805, The Impact of New Agricultural Technology on Rural Employment and Income, directed by Professor J. W. Mellor in this department. Because of the 211(d) grant, a larger number of students are able to work on agricultural development problems than those specifically integrated into research under Mellor's contract. Findings and methodology associated with the contract can be tested on other projects and in different locations. The employment and income distribution issues which are central to the contract research program may be incorporated where appropriate in research associated

with the grant. A larger total effort is made possible by this exchange and interaction than would be possible if each were separate entities in terms of location and overall conception.

The existence of a substantial group of students together with faculty input concerned with markets, market institutions and international trade has increased overall student and faculty awareness of this set of dimensions in considering employment and income issues associated with new agricultural technology. Field research in both instances allows testing of hypotheses and continued improvement in underlying models proposed by Mellor and his associates.

It is particularly gratifying to report an additional professional interaction in graduate research associated with the 211(d) program. A Ph.D. student at Cornell directed by Professor D. G. Sisler is doing his field research in Western Nigeria in a project closely associated with the work of Professor Carl Eicher at Michigan State University. In a real sense this reflects cooperative effort by two of the grant institutions to test alternative hypotheses and develop a closer research and teaching linkage. Mr. Matlon will make use of Michigan State resources already available in the field in Nigeria. Before leaving New York State he spent part of the summer 1973 working with staff and students on research and projects in East Lansing, Michigan. He is now in the Oyo District of Nigeria. Professor K. L. Robinson, one of our faculty, is on sabbatic leave during the academic year 1973-74 as an economist at the International Institute of Tropical Agriculture, Ibadan, Nigeria. He will serve as Matlon's faculty contact in Nigeria during the year.

III. Accomplishments

1. Teaching. One of the major objectives of this grant is to improve and strengthen the competence of the faculty in agricultural economics to contribute to the solution and understanding of development problems in developing countries. A graduate teaching program which clearly recognizes the needs of students concerned with development problems associated with the agricultural sector has been developed over time. The grant has provided stimulus to our teaching program in a variety of ways.

(a) A seminar on Agriculture and Economic Planning Models was developed jointly by Drs. Mellor and Lele in 1970-71 and formalized and included in 1971-72 in college and graduate school catalogs as a regular graduate course in the Department. A description of the course as it now appears in our announcement follows:

Ag. Ec. 669. Seminar on Agriculture and Economic Planning Models. Spring term. Credit three hours. Prerequisite: basic macro-economics and quantitative methods. Warren 361. Mr. Mellor.

The seminar will deal with planning models as applied to less developed economies and will emphasize the interaction between the agricultural and the nonagricultural sectors. The course will begin with discussion of one-sector models of the Harrod-Domar type, proceed to deal with the labor surplus models such as the Lewis, the Fei-Ranis, and the Jorgensen models and then to the multi-sectoral models of the linear programming type. Finally, it will examine the models in the light of various questions related to planning such as balanced vs. unbalanced growth, choice of techniques, foreign trade, etc.

This course serves both the needs of graduate students in agricultural economics and the interests of visiting scholars, post doctoral fellows and others interested in development issues on campus.

(b) As part of the teaching program associated with Ag. Ec. 464, Professor J. W. Mellor instituted a series of visiting lectures both for students registered in the course and others on Wednesday evenings

during the spring term 1973. This made possible for the community at large to meet and interact with a number of scholars and research workers much beyond the range of normal classroom experience. This group of lecturers included:

- | | |
|-------------|---|
| February 21 | "Strategies of Rural Development"
Uma J. Lele, Economist
International Bank for Reconstruction
and Development |
| February 28 | "Aspects of Rural Development in China"
Benjamin R. Stavis
China Japan, International Studies
Cornell University |
| March 14 | "The International Agriculture Research
System and its Affect on Production"
Robert F. Evenson
Economic Growth Center
Yale University |
| April 4 | "Induced Innovation as it Relates to
Agricultural Growth"
Vernon W. Ruttan, Head
Department of Agricultural Economics
University of Minnesota |
| April 11 | "The World Bank and Rural Development"
Montague Yudelman, Director
Agriculture Department
International Bank for Reconstruction
and Development |
| April 18 | "Ranking of Policy Interventions in the
Harris-Todaro Model"
T. S. Srinivasan
Massachusetts Institute of Technology |
| April 25 | "Rural Employment Research and Programs
in Africa"
Carl K. Eicher
Michigan State University |

(c) The seminar, Economics of Agricultural Development, Ag. Ec. 668, was offered in the spring term 1973 by Professors Sisler and Penny. Emphasis in this seminar was placed on research methodology and design of field research programs. Each graduate student participating presented either a critique of his own field experience in relation to

his thesis project or the design and plan for his thesis problem and programs planned for testing hypotheses posed. Visiting Professor Penny provided substantial inputs from his own extensive research experience in Indonesia. Both faculty and students were enthusiastic about the teaching and the seminar experience.

(d) The seminar on Latin American Agricultural Policy, Ag. Ec. 655, offered annually by Professor Donald Freebairn, continues to attract students majoring in a number of fields as well as those in agricultural economics. This graduate course has been particularly successful in helping students use economic principles and models in analyzing substantial programs for change within Latin American countries as well as the underlying shifts in resource use, markets, trade and balance of payments problems.

(e) A list of graduate students in agricultural economics with primary interest in problems of agricultural development during the academic year 1972-73 includes:

U. S. Students

<u>Name</u>	<u>Degree Sought</u>
Beeghly, Weyland W.	M.S.
Burton, William	Ph.D.
Calkins, Peter H.	Ph.D.
Doering, Otto C. III	Ph.D.
Eyres, Leland C.	Non-Cand.
Garcia, Philip	M.S.
Goldman, Richard H.	M.S.
Kraft, Steven E.	M.S.
Kreitman, Richard C.	M.S.
Matlon, Peter J.	Ph.D.
Montgomery, Roger D.	Ph.D.
Popkin, Barry M.	Ph.D.
Schultheis, Michael J.	Ph.D.
Shortlidge, Richard L., Jr.	Ph.D.
Smith, Peter E.	M.S.
Staatz, John	M.S.

Foreign Students

<u>Name</u>	<u>Degree Sought</u>	<u>Country</u>
Akenda-Ondoga, Valentine	M.S.	Uganda
Akinwumi, James A.	Ph.D.	Nigeria
Badillo, Arnaldo J.	Ph.D.	Venezuela
Belt, Juan C. B.	Ph.D.	Cuba
Burger, Veit	Ph.D.	Austria
Colmeneres, Adolfo G.	M.S.	Venezuela
Dabholkar, Uttam	Ph.D.	India
Desai, Bhupendra M.	Ph.D.	India
Donovan, W. Graeme	Ph.D.	New Zealand
Falusi, Abiodun O.	Ph.D.	Nigeria
Ferroni, Marco	M.S.	Switzerland
Hart, Gillian P.	Ph.D.	South Africa
Jackson, Geoffrey H.	Ph.D.	Australia
McGregor, Andrew M.	M.S.	Australia
Monardes, Alfonso T.	Ph.D.	Chile
Noori-Naini, Mohammad S.	M.S.	Iran
Odegaard, Knut	M.P.S.	Norway
Piggott, Ronald R.	Ph.D.	Australia
Rahman, Radzuan A.	Ph.D.	Malaysia
Ranade, Chandrashekhar G.	Ph.D.	India
Rukandema, Fred M.	Ph.D.	Uganda
Saleh, Hormoz	Ph.D.	Iran
Salem, Ali B. Z.	Ph.D.	Tunisia
Schluter, Michael G.	Ph.D.	England
Shapouri, Hosein	M.S.	Iran
Shapouri, Shahla R.	M.S.	Iran
Shillingford, John D.	Ph.D.	Dominica, W. I.
Sobrinho, Antonio D.	Non-Cand.	Brazil
Tecle, Tesfai	Ph.D.	Ethiopia
Villagran, Eduardo	M.S.	Guatemala
Wang, Hu-mei	Ph.D.	Taiwan
Worachai, Laxmi	M.S.	Thailand
Yadav, Ram P.	Ph.D.	Nepal
Zulberti, Carlos A.	Ph.D.	Argentina

(f) The following graduate students were overseas collecting data and working on thesis research during the 1972-73 academic year:

<u>Name</u>	<u>Dates Abroad</u>		<u>Country</u>
	<u>From</u>	<u>To</u>	
Dabholkar, Uttam	Jan. 1973	April 1973	India
Desai, Bhupendra M.	Feb. 1973	August 1973	India
Donovan, W. Graeme	Nov. 1971	Dec. 1972	India
Ferroni, Marco	June 1973	Sept. 1973	Peru
Kreitman, Richard C.	June 1972	Sept. 1972	Venezuela
Montgomery, Roger D.	July 1971	Dec. 1972	Indonesia
Popkin, Barry M.	May 1973	August 1973	Philippines
Schluter, Michael G.	July 1971	March 1973	India

Schultheis, Michael J.	July 1971	July 1973	Uganda
Shillingford, John D.	March 1972	Nov. 1972	Jamaica
Tecle, Tesfai	June 1972	Feb. 1973	Ethiopia
Zulberti, Carlos A.	June 1972	June 1973	Argentina

Funds for overseas research for these students came from a wide variety of sources including New York State, Ford Foundation, Rockefeller Foundation, The World Bank, national governments for individual students and USAID. In a number of cases, more than one source of funds helped support these student and faculty research programs.

(g) During the academic year 1972-73, the following students completed advanced degrees and wrote theses concerned with problems associated with agricultural development in less developed countries.

<u>Name</u>	<u>Degree</u>	<u>Thesis Title</u>
Antholt, Charles H.	M.S.	Implication of Technological Change for Increasing Agricultural Production in the Rapti Valley, Nepal, 1972-1981.
Beeghly, Weyland W.	M.S.	Nutrition, Employment, and Working Efficiency: Toward Measuring Human Activity in the Rural Tropics.
Cordaro, John B.	M.S.	An Inquiry into the Agency for International Development's Commercial Studies High Protein Food Program.
Falusi, Abiodun O.	Ph.D.	Economics of Fertilizer Distribution and Use in Nigeria.
Kolawole, Michael I.	Ph.D.	An Economic Study of Tractor Contracting Operations in Western Nigeria.
Korchitmet, Buranee	M.S.	Seasonal Price Movements of Corn in Thai Export Markets.
Levinson, Franklin J.	Ph.D.	An Economic Analysis of the Determinants of Malnutrition Among Young Children in Rural India.

Robertson, Charles A.	Ph.D.	Economic Analysis of Ground Water Irrigation in Nueva Ecija, Philippines.
Rukandema, Fred M.	M.S.	Economic Analysis of Resource Use in Peasant Agriculture: A Case Study of the Finger Millet-Cotton Zone of Uganda.
Saleh, Hormoz	Ph.D.	An Econometric Analysis of the Demand for Animal Protein in Iran.
Shortlidge, Richard L., Jr.	Ph.D.	The Employment and Earnings of Agricultural Graduates in India A Benefit-Cost Study of G. B. Pant College of Agriculture and Technology.
Swanberg, Kenneth G.	Ph.D.	The Potential Impact on Nutritional Status of Reducing Marketing Costs Through Marketing System Manipulation in Low Income Developing Countries.
Villagran, Eduardo	M.S.	Economic, Environmental and Policy Aspects of Electricity Development in Guatemala.

2. Research . Funds from the 211(d) grant have made possible faculty and graduate student research at the Ph.D. level which could not have been undertaken without such new resources. In principle, we have sought to build on existing interests and research programs of faculty and their overseas contacts rather than to develop completely new areas and country affiliations. Recognizing that the grant is intended to add to competence and extend opportunities, a substantial share of the resources have been used to support overseas research by graduate students in projects jointly planned by faculty here at Cornell, professionals at an institution in a less developed country and the students. In this sense, the grant has strengthened institutional capability in the United States and overseas. The projects have been net additions to research which otherwise would not have been possible.

(a) EMPLOYMENT AND COMPARATIVE ADVANTAGE IN A RURAL AREA OF JAVA:

An input-output study of Jogjakarta, Indonesia - Roger Montgomery and Professor D. G. Sisler

This study is an example of the complementary relationship between research conducted under Professor Mellor's contract and that done as a result of the 211(d) grant. Central concern in this study is an analysis of the comparative advantage of the most densely populated region on the island of Java, which itself is one of the most densely populated areas of the world. Concern is also given to resource endowments and factor intensities of production with a view toward explanation of trading patterns and regional payments balances. Measurement and concern for employment and income distribution reflect the impact of related research at Cornell under the USAID contract, c.s.d. 2005.

This research has enjoyed the cooperation of the economics faculty at Gadjah Mada University in Jogjakarta and our staff. Dean Sukadji Ranuwihardjo, Professors Atje Partadiredja and Mubyarto of Gadjah Mada and Professor Sisler of Cornell have organized the field study. Analysis of data is now in progress. Mr. Montgomery was in Jogjakarta from October 1971 through December 1972, and has been at Cornell since that time. A progress report follows:

Java is experiencing rapid urbanization in its two largest cities, Djakarta and Surabaya. Not only are nominal wages rising faster in these cities than in the rural areas of the island, but also expected urban incomes are rising more than expected rural incomes. Although measures from censuses and national surveys do not fully reveal this picture, unemployment is on the increase in the cities. Recent studies have shown that if more accurate measures of unemployment are used, rates of unemployment in many LDC's may range from 10 to 25% of the labor force. There is

a considerable need to know how the stream of unskilled rural workers to the cities can be regulated and even diverted into productive employment by expanding the demand for labor within rural areas, both in agricultural activities and industrial goods production. The broad goal of this research is to establish the links between (a) factor productivity among agricultural production activities, (b) aggregate employment levels across sectors for an entire region, and (c) the nature of comparative advantage and rational trading patterns for the region of Jogjakarta, Central Java, Indonesia. The following specific objectives are of concern:

- 1) To determine current levels of effective employment, not by ordinary census measures, but as a function of levels of production of a specific number of categories of goods and services.
- 2) To forecast, for a period of 10 years, possible increases in demand for labor services as a function of increases in production under different alternative growth paths of income.
- 3) To estimate current interregional trade patterns, and how they may realistically change over the next decade. Special attention will be given to the potentials for export expansion.
- 4) To identify specific bottlenecks which may arise during these expansion paths. Particular emphasis will be given to the transportation sector, whose facilities are already being used at capacity.

A survey of 130 farm enterprises was conducted by Mr. Montgomery and his three assistants during 1972. The data which has been generated from this provides information on production, capital and land owned and acquired, as well as labor use for (a) rice production (detailed by 16 steps in the production process) and classified by rice variety (10 varieties

including Ir-5 and Ir-6). (b) farm food crops such as maize, soybeans, peanuts, upland rice, onions, spinach, tomatoes, cabbages, beans, radishes, etc. (c) farm non-food crops such as fibers, coconuts, cacao, coffee, tea, vanilla beans and eucalyptus. (d) estate crops, primarily sugar and a cigar tobacco; and (e) labor engaged in other non-agricultural occupations.

The model is based on the Leontief Input-Output model consisting of 16 sectors, including agricultural or agricultural processing sectors. The input-output matrix for agricultural activities is derived entirely from the data provided by the regional and national statistical agencies. The model is based on the work of the Institute of Economics (Kyoto University) LKMIAS (Indonesian Institute of Economic Studies, Djakarta) studies on input-output structure of the Indonesian economy.

The results of the research appear to indicate that in the case of the Jogyakarta region there is no paradox. Agricultural products and raw materials form a large part of regional exports, while imports include farm inputs and finished goods. A surprisingly large deficit in the regional balance of payments exists. Apparently this balance is offset by family members leaving the region to work in cities and sending a significant amount of money back to those remaining within the region. One of the major contributions of the research is the development of an analytical framework for detecting how regional export surpluses are generated, and in turn how they contribute to the comparative advantage of the national economy.

An initial report, based not on the input-output model, but upon preliminary tabulations of the farm sample, was presented in the form of a paper delivered at the meetings of the Association of Asian Studies held in Chicago on March 30 - April 2.

Mr. Montgomery has accepted employment on completion of his Ph.D. at the University of Michigan in their international studies program. His first assignment will be on a project in West Africa. He will be located in the Ivory Coast at Abidjan.

(b) AN ECONOMETRIC ANALYSIS OF THE DEMAND FOR ANIMAL PROTEIN IN IRAN - Hormoz Saleh and Professor D. G. Sisler

This research was completed in November of 1972. Mr. Saleh was awarded his Ph.D. degree in January of 1973. His dissertation, "An Econometric Analysis of the Demand for Animal Protein in Iran", provides a detailed report of both findings and methodology. An abstract of the thesis was included in the annual report for 1972. Two publications based on the research have been prepared and are presently in the review and final editing state. The first of these is entitled "An Econometric Analysis of the Demand for Animal Protein in Iran." It provides an overview of the research and emphasizes research findings as they relate to the present and projected demand for mutton, beef, poultry and fish in Iran. This monograph also provides estimates of the international trade implications of Iranian demand for red meat and poultry. The second manuscript is entitled "The Implications of Altered Income Distribution to the Demand for Animal Protein in Iran." This paper presents a methodology for determining the implications of income distribution to the demand for meat within Iran and has been submitted for publication to Econometrica. Typically, researchers estimate demand based on variables such as aggregate or per capita income. This methodology is intended to provide an analytical technique to determine the demand implications of changing income distribution in a developing country.

Mr. Saleh returned to Iran after completion of his degree and entered military service as required by his government. He will be involved in a

large scale feed lot operation for beef and lamb near Teheran as well as working with a major export-import business in Iran specializing in meat, livestock products, and live animals. He also hopes to be associated with one of the government agencies concerned with agriculture and natural resources.

(c) THE IMPACT OF TOURISM ON THE BALANCE OF PAYMENTS, NATIONAL INCOME, AGRICULTURAL PRODUCTION AND EMPLOYMENT OF LOW INCOME COUNTRIES: A CASE STUDY IN NEPAL - Veit Burger and Professor D. G. Sisler

Objectives. The objectives of the project fall into three distinct, but clearly interrelated categories:

1. To develop and evaluate a methodological framework to assess tourism's contribution to the achievement of economic objectives of developing countries.

2. To carry out a case study in Nepal, using this methodology, to provide Nepal's development planners with information concerning the impact of tourism on the following variables:

- a) The balance of payments and trade position
- b) National income
- c) Personal income distribution
- d) Regional income distribution and
- e) The level of employment

3. To analyze tourism's impact on the agricultural sector and to delineate the areas, where there is potential to increase agricultural production.

Given the determination of the Nepalese government to develop tourism, it will be desirable to go beyond merely assessing tourism's impact as a whole and to provide policy planners with information as to implications of alternative tourism development strategies. Hence

emphasis will be placed on delineating distinct categories of tourism, and tracing through the different impacts they will have on these macro-economic variables. Generally speaking, the ideal classification would include categories which are as homogeneous as possible with respect to class-characteristics and as diversified as possible with respect to their impact on national economic objectives. A more detailed classification of tourists will increase the flexibility of the study but will also increase costs of surveys and the sample size. We propose the following classification with respect to purpose of visit:

- a) Cultural tourists
- b) Trekking tourists

A cultural tourist will be defined as a visitor who stays in Nepal for an average of three to four days, mainly to visit the historical, cultural and religious places in Kathmandu Valley. The second category of tourist, the trekking tourist, includes visitors who stay an average of one week or longer, and who seek to discover and explore places outside Kathmandu Valley. A third type of tourist, the business visitor, will not be analyzed due to the relative unimportance of this category (in 1969 only 2% of the total) and because this type of tourism responds mainly to the overall development of the economy rather than to tourism policies.

The main hypotheses to be tested are:

Per one million rupees of national income generated, trekking tourism:

- a) Earns more foreign exchange
- b) Results in a more equal income distribution
- c) Generates less direct, but more indirect and induced employment
- d) Stimulates more equal regional development
- e) Generates less demand for high income-elasticity agricultural products

These hypotheses logically can be derived almost entirely from two basic propositions. First, the spending pattern of trekking tourists is believed to be less import-biased and more labor-intensive than the spending pattern of cultural tourists. Second, the income-expenditure pattern of factor owners, benefiting from trekking tourism also is to be less import-biased and more labor-intensive than the income-expenditure pattern of factor owners benefiting from cultural tourism.

With respect to regional development, one is tempted to hypothesize that almost by definition, trekking tourism will have a more widespread regional impact, since trekking tourists spend some time in regions other than Kathmandu Valley. The correct criterion, however, is not where goods and services are finally consumed by the tourist but rather in what region the owners of the factors of production spend their incomes. If, for example, the Tiger Tops Hotel in Chitawan "imported" all its capital, food, labor, etc. from Kathmandu, its regional impact would be zero. On the other hand, expenditures in Kathmandu need not necessarily be restricted in impact to that region. If, for example, agricultural products were imported from other regions, they would create additional income there. The impact on that region could be ignored only if the income earner's marginal propensity to import from other regions plus his marginal propensity to save and pay taxes are equal to one.

Tourism's impact on the agricultural sector will receive special consideration and scrutiny, simply because of the special importance of the agricultural sector in the economy of Nepal. As mentioned earlier, agriculture alone constitutes 70% of national income and employs roughly 90% of the total population. Many development economists now believe, that alleviation of the present unemployment and underemployment situation presents one of the most pressing problems in many LYC's and

should be dealt with through the creation of job opportunities in the agricultural sector.

The field work of the proposed project will be carried out in Nepal for approximately 12 months between October or November 1973 and October 1974. The United States Agency for International Development and the International Bank for Reconstruction and Development will be consulted for assistance in making the research relevant and in obtaining the most recent and reliable data. In Nepal, both Tribhuvan University and the Department of Tourism in the Ministry of Industry and Commerce will provide logistic support. This would include mainly help in finding and getting access to data sources and in hiring capable field workers. Furthermore, we hope to be able to use the facilities of these institutions to allow tabulation and a first analysis of the data.

(d) AN ECONOMETRIC MODEL FOR THE FOREIGN TRADE SECTOR OF INDIA -

Ram Yadav and Professor D. G. Sisler

The role of international trade as a source of foreign exchange earnings through exports and as a supplier of materials through imports has great importance for most less-developed countries. As real-world trade is not free but restricted, guidelines are needed with which to evaluate the effectiveness of such economic policies as tariff reduction, export promotion, and the effects of devaluations of domestic and foreign currencies on export and import levels of individual products.

Objectives of this study:

- (1) An analysis of the pattern of Indian trade from 1960-61 to 1970-71
- (2) An estimate of the elasticities of demand for Indian imports and exports for selected principal commodities

(3) An examination of the effects of various trade policies on imports and exports for these different commodities (or groups of commodities)

(4) An analysis of the impact of the trade sector on employment in India and Indian income

Proposed methodology and classification procedures:

Since least-squares regression analysis of historical data may lead to unreliable and/or biased estimates for foreign trade price elasticities, this study will use several techniques for estimating the import and export demand functions. An attempt will then be made to compare the performance of each of these different estimation techniques. To estimate the elasticities of demand for imports, the quantity and unit value indexes for India will be used. A multiple regression analysis technique will be used for estimation of alternative import functions. Import demand for the following major commodity groups and subgroups will be estimated:

- I. Food
 - a. Dairy
 - b. Cereals and cereal preparations
 - c. Fruits and vegetables
- II. Beverages and Tobacco
- III. Crude Materials (Inedible) Except Fuels
 - a. Capra
 - b. Wool and other animal hair
 - c. Raw cotton and other lints
 - d. Crude fertilizers
- IV. Chemicals
 - a. Elements and compounds
 - b. Dying, tanning, and coloring materials
 - c. Fertilizer, manufactured
- V. Animal and Vegetable Oils and Fats
- VI. Mineral Fuels and Lubricants
- VII. Manufactured Goods
 - a. Paper and paperboard
 - b. Textile yarn and thread

- c. Iron and steel
- d. Copper
- e. Aluminum
- f. Zinc
- g. Manufactured metal products

- VIII. Machinery and transport equipment
 - a. Machinery, other than electric
 - b. Machinery, electric
 - c. Transport equipment

- IX. Miscellaneous manufactured products

The application of simultaneous methods of estimating regression equation involves the formulation of a set of demand equations and a set of supply equations. The necessary variables may be income, the commodity's own price, the price of the same commodity from an alternative source, and the price of all other commodities to be considered. The export demand function will be examined for the following five commodities:

- (1) Tea
- (2) Cashew kernel
- (3) Jute (bags and cloth)
- (4) Oil cakes
- (5) Cotton piece goods

In addition, Mellor and Mudahar have together developed a simulation model of the Indian economy which focuses on analysis of the impact of technological change on agricultural production, sectorial employment patterns, consumption patterns, and the subsequent interactions between the supply and demand of wage goods. This model will be used to test the regression coefficients and conclusions of the preceding partial analysis. This study will attempt to analyze the implications and interactions of the trade sector endogenously in this simulation model.

(e) AN EXAMINATION OF THE DISTRIBUTION OF POLICY-INDUCED INCOME
AND LABOR EFFECTS AMONG PRODUCERS OF A SELECTED CASH CROP IN NIGERIA -

Peter Hatlon and Professor D. G. Sisler

This research project will examine existing patterns of employment and income distribution and the micro-level, short-run impact of agricultural policies on these two variables among producers of a selected cash crop in Nigeria. Field work for this project will be initiated in October 1973 and will extend through the subsequent 12 to 18 months. During this period, data will be collected from a sample of farms stratified by differences in land quality, use or non-use of purchased inputs embodying new technologies, and location relative to marketing centers.

Observed patterns of income distribution and labor allocation will be described and explained as a function of institutional, locational, structural, and ecological factors. Linear programming models will be constructed for a set of representative farms reflecting a range in the structural and ecological characteristics of the farm sample. Subsequent analysis will attempt to identify the potential production, income, and labor effects of price, and credit policies and of new technologies among farm types. Particular emphasis will be focused upon the relationship of these policies to changes in the allocation of labor to agricultural and non-agricultural activities.

The objectives of the research can be arranged into three separable but highly interdependent components: (A) income distribution issues (B) rural labor allocation and (C) traditional farm management problems.

(A) Income Distribution:

1. Description of the existing patterns of income distribution among producers of a selected cash crop and determination of the most important factors contributing thereto. The independent variables examined will be subdivided into these three groups:

- a. Institutional - political and institutional affiliation biasing access to credit, inputs, and extension services
 - b. Locational - access to marketing networks
 - c. Structural/Ecological - land type, farm scale, size of the family labor force, techniques of production, etc.
2. Determination of the differential impact of alternative pricing policies for agricultural inputs and products, credit policies, and new cash crop technologies on farm incomes among distinct farm types.
- (B) Labor Allocation:
1. Construction of seasonal labor profiles describing allocation of labor time to on-farm agricultural and non-agricultural and off-farm activities as they relate to farm unit and labor characteristics; stratified three ways as follows:
 - a. Locational
 - b. Structure/Ecology
 - c. Income
 2. Determination of the differential impact on demand for labor and labor allocation associated with government pricing and credit policies and technology promotion among various farm types.
- (C) Farm Management:
1. Description of existing farming systems and testing of current patterns of resource allocation against the standard of economic efficiency.
 2. Identification of major structural constraints to increased output by farm type as a function of policy alternatives.

3. Generation of farm plans for a set of representative farms which will maximize farm incomes within a set of objective and subjective constraints.

Correlation and multiple regression techniques will be used to assess the relative importance of the institutional, locational, and structural factors affecting income distribution and of the locational, structural, and income determinants of labor allocation patterns. Linear programming methods will be used as the basic tools with which to consider the structural and farm management questions of the study. Modified simplex and variable coefficient and resource programming procedures will be followed.

This project was developed cooperatively with staff at Michigan State University and the support of Professor David Norman at Ahmadu Bello University, Zaria, Nigeria. Field enumerators and support work will be coordinate with research efforts of the agricultural economics staff at Zaria.

(f) POPULATION GROWTH, LABOR UTILIZATION, AND REGIONAL DEVELOPMENT

III UGANDA - Michael J. Schultheis and Professor T. T. Poleman

The field studies involved in this research project were carried out in Uganda over a 20 month period during 1971 and 1972, while the director was affiliated with the Makerere Institute of Social Research as a research associate and with the Department of Rural Economy an Extension of Makerere University, Kampala, Uganda, as a part-time lecturer. The research study was made possible with the financial support of US/AID and Cornell University, Rockefeller Foundation and Makerere University, and The Uganda Government through the National Research Council.

I. Statement of Purpose.

A. The Problem: Rapid population growth and the emergence of growing numbers of job seekers in the town and urban centers characterize most low-income countries. Uganda is no exception. The 1969 Census enumerated

9,548,847 persons in Uganda, which represents an increase of more than three million over the decade and an annual growth rate among the highest of any country in the world at 3.5%. Barring an unlikely change in fertility or mortality ratios, Uganda's population will have surpassed 13 million people by 1979 and will have doubled again before the end of the present century.

Uganda's population remains largely rural. In 1969 only 7% were classified as "urban" i.e. those living in towns of more than 2,000 people. This fact must be weighed together with the youthful nature of the population. Nearly 50% are under 15 years of age, and 20% under five years. This year approximately 200,000 young men and women entered the ranks of the potential labor force.

It is all but impossible to estimate with any margin of certainty the number of persons in the "active" labor force. The annual "official" enumeration of employees, which attempts to cover every firm employing one or more persons for a cash wage or a contract salary, reported 312,352 people employed in the public and private sector in 1970. No effort has been made in Uganda to enumerate domestic servants or employees of peasant farmers, but some estimates placed the number of domestic servants as high as 38,000 in 1970, and the number of unskilled or casual workers on commercial agricultural estates at 75,000. The importance of the "informal" or "non-wage" sector as an alternative source of income and employment has been stressed in recent research, but in Uganda this sector seems to be neither very large nor an alternative for the many who seek permanent employment.

Recent policies implemented by the government of Uganda certainly have disrupted the growth of the modern sector of the economy. It is reasonable to assume that several years will elapse before employment in

the private sector again reaches the mid-1972 level, but the expansion of the military and other governmental bodies may minimize the overall unemployment effects. However, it has long been recognized that the "modern" sector, whatever its rate of growth, could provide employment to only a very few of those who enter the potential labor force each year. The corollary is that the rural areas necessarily will continue to be the residence and the source of livelihood for most of Uganda's growing population.

This fact was recognized and expressed in the Third Five Year Development Plan, and more recent policy statements have placed an even greater emphasis on the integrated physical and economic development of the rural areas. At the same time, there is the recognition that development planning of this nature requires a much better understanding of the dynamics of the rural and regional economies, especially of the patterns of labor utilization and the response of individuals and communities to various incentives.

B. The purpose of the present study: This study was designed to provide such basic information on the interactions between population growth and labor utilization and to evaluate some of the alternatives available for creating employment opportunities and new possibilities of participation in the local economy. The research study addressed itself to providing information and answers to the following questions:

- 1) What is the overall picture of population distribution and density and the relationship of these factors to land use and agricultural production systems in Uganda?
- 2) How have these relationships changed as a result of population growth, settlement and migration?

- 3) What is the general pattern of labor participation in agricultural and non-agricultural activities, and how do seasonal fluctuations in the agricultural cycle condition the demand for labor?
- 4) What is the pattern of labor migration and who are the migrants, how do they leave home, and under what conditions do they enter another environment?
- 5) How do the migrants differ from those who remain home, and what correlations exist between migration and age, education, and sex; between migration and types of farming systems where the mix of incentives and rewards differs; between migration and the level of development of the local communities?
- 6) What capacity exists for the present agricultural systems to absorb more population before diminishing returns to both land and labor occurs? Under what conditions is there potential for increasing agricultural productivity and thereby, rural incomes and work incentives?
- 7) Finally, what is the scope for the generation of employment opportunities at the regional level, either by increasing the labor inputs into the farm production unit through a modification of the incentive and opportunity structure, or by expanding rural works programs which will benefit the local residents?

Implicit in these questions are several hypotheses regarding the relationship of population density to land use; the causes, nature, selectivity of the migration process; and the relevancy of different models of development theory, which embody various assumptions of land ownership and surplus labor.

II. Methodology.

To obtain information on the general features of the economy and the population, aggregate data were gathered from official and other published sources at the national and district level. Population distribution, growth rates, and density and settlement patterns were noted and mapped. Agricultural production records and cropping patterns, land and resource use and potential, the size and composition of the labor force, and patterns of economic activity were assembled for each district. However, since much of the specific information which was needed could not be obtained from such sources, Kigezi District, an area of high out-migration located in southwestern Uganda, was designated for a case study of these related factors and for a consideration of development strategies at the regional level.

Aggregate data sources were consulted for the general features of the District economy, and three separate but complementary surveys were undertaken to fill in the "micro" features. The first of these, a double-run migration survey, sought to identify all the young people, ages 15 to 36, who were present or past members of households in 22 selected enumeration areas across the District, and to obtain specific information on such characteristics as age, education, occupation, and present location. A dynamic element was introduced into this survey by means of a follow-up enumeration approximately 12 months later.

A second questionnaire, which was administered to approximately 10% of the households in these enumeration areas, focused on the farm household unit, the employment and migration experience of the household head, the composition of the family, and the nature of the farming enterprise. And the third questionnaire obtained information from the local chiefs

on the history and development of their areas, the introduction of new crops and services, and their perception of the problems facing the people.

The selection of the sample followed basic random sampling procedures. The survey areas were chosen to coincide with the 10% sub-sample of rural enumeration areas selected by the 1969 Population Census for a supplemental questionnaire on migration, fertility, and education. An effort was made to obtain information from each household within each of these enumeration areas. With the assistance of a research team composed of 10 young secondary school leavers from the area, some 11,090 households were visited and 27,576 young persons enumerated. In addition, 1,133 household heads were interviewed for information relating to their household and farming enterprise.

The actual supervision and administration of the field surveys has been described in detail in a paper presented to the East African Agricultural Economics Conference held in Kampala in June 1972. The second round migration survey was begun in July 1973 and eventually completed, after a period of uncertainty and delay, in January 1973.

III. Preliminary Results.

The survey information was coded with the assistance of several university students and the data was transferred to computer cards at Makerere University. An initial tabulation of the responses to the labor migration survey also was prepared at Makerere and these preliminary results, mostly descriptive, were distributed to interested ministry and university personnel in Uganda. (cf. H. Schultheis, "Occupation and Mobility in Kigezi: A Summary of A Regional Labour Migration Survey," RDR Paper No. 124, Makerere University, Kampala, June 1973).

Since the computer facilities at Makerere lacked the capacity to aggregate the data beyond the primary enumeration unit, the director recently returned to Cornell University where the analysis of the data continues. It is hoped that the study will be completed by early spring. In addition to testing several hypotheses on labor migration, a regional model which incorporates population dynamics and resource use and considers employment creation as a primary objective of development planning will be presented and evaluated.

3. Publications and Outreach. One of the important components of research and scholarly activity is publication and presentation of the results from faculty and student work. Because financial resources are always limited and graduate students are not motivated always to pursue publication from their theses, some potentially useful research results do not reach those people who could make use of them. A part of grant funds has been used to place results from student theses in published form. These are theses or studies with a substantial international dimension completed in the field of agricultural economics but which otherwise might not be available except in the Cornell University library. These are in addition to work done under the US/AID grant and contract located here.

Appended to this report is a list of publications concerned with international agricultural development prepared by faculty and staff between July 1, 1972 and June 30, 1973 as well as a few other publications not listed a year ago. Funding for these publications came from a wide variety of sources. The most substantial inputs came from the State of New York through the budget of the College of Agriculture and Life Sciences.

One substantial group in the list of publications at the end of this report reflects the work of Professor L. B. Darrah and his Filipino associates in the National Department of Agriculture and Natural Resources, Manila, Philippines. After spending two years as a Cornell faculty member located at the College of Agriculture, University of the Philippines, Dr. Darrah accepted a continuing assignment to help develop a research unit within the national government concerned with the economic problems of agriculture. Funding for this position has been provided by the Ford Foundation and the Philippine Government. Dr. Darrah's work is an effective example of the kind of faculty interaction which we understand to be a purpose of the 211(d) program. While his work is not financed with US/AID funds, it well could be except perhaps for the direct sponsorship. Dr. Darrah is working with a small but hard working staff of professionals.

The focus of their work is in marketing and market development. There is a field research component in most of the work. Policy and legislative decisions are being made on the basis of these studies. It is instructive to look at the range of the problems studied and the possibility of applying results from these studies to current issues in the country. The most significant aspect of this effort in the long run will be determined by the degree to which the Filipino staff organizes to carry on a research program which is of their own design and for which they insure scientific objectivity. This is the intent of Professor Darrah and the sponsoring organization. An excellent start has been made.

Another kind of outreach associated with faculty and graduate student research is the lecture, seminar and consulting activities of

faculty and staff. A listing of some of the important activities in which faculty participated follows:

Forker, O. D.

Seminar - Marketing and Price Policy--Economic and Social Studies Conference, Turkey, October 2-6, 1972.

Seminar - Marketing and Agricultural Policy--USDA Program for Turkish Officials, Washington, D. C., March 1973.

Freebairn, D. K.

Seminar - "Agricultural Product Growth in Lower Income Countries," Cornell I.L.R., Labor Productivity Study Program for International Labor Union Leaders, April 9-11, 1973.

Participant - Conference on Economic Relations Between Mexico and the United States, University of Texas at Austin, April 16-20, 1973.

Hedlund, G. W.

Lectures and consultation with staff of Agricultural Development Fund of Iran, Agricultural Projects Course, Iran, November-December 1972.

Kearl, C. D.

I.A.D. 602 seminars - Dominican Republic and Puerto Rico, January 1973.

Hellor, J. T.

Participant in seminar - "The Commodity Approach to Sectoral Planning for Rural Development," SEADAG Rural Development Seminar, Singapore, September 18-20, 1972.

Present seminar - "Jobs, Poverty and the Green Revolution," North Carolina Agricultural and Technical State University, October 12, 1972.

Present seminar - "Generating Employment in Bangladesh: Some Special Problems and Their Possible Solution," Midwest Asian Conference, University of Illinois, October 14-15, 1972.

Present discussion - "Domestic Markets and Agricultural Development," Agricultural Development Workshop, University of Minnesota, October 19-20, 1972.

Present seminar - "Growth Linkages of Technological Change in Agriculture," I.I.T., October 27, 1972.

Discussant - "The Application of Recursive Decision Systems to Agricultural Sector Analysis," A/D/C Seminar, Washington, D. C., November 1-3, 1972.

Lecture - "Growth Models and Rural Development," Department of Economics and Institute of Development Research, Addis Ababa, Ethiopia, November 6, 1972.

Lecture - "Aid, Trade and Growth of Employment," Society for International Development Research, Addis Ababa, Ethiopia, November 9, 1972.

Lecture - "Employment and Growth Linkages of Technological Change," Haile Sellassie I University, Addis Ababa, Ethiopia, November 10, 1972.

Seminar on Growth Models and Rural Development, Department of Economics, University of Ibadan, Nigeria, November 13, 1972.

Lecture - "Aid, Trade and Growth of Employment," Nigerian Institute of Social and Economic Research, November 13, 1972.

Lecture - "Growth Models and Rural Development," Economic Society of Ahmadu Bello, Zaria, Nigeria, November 15, 1972.

Address - weekly seminar - Faculty of Social Science, Ahmadu Bello University, November 15, 1972.

Lecture - "Employment and Growth Linkages of Technological Change in Agriculture," Staff of IAR, November 15, 1972.

Seminar - Economic Planners from Kano, November 18, 1972.

Seminar - Federal Economic Planners and Agricultural Development Specialists, Lagos, Nigeria, November 20, 1972.

Lecture - Institute of International Affairs, Lagos, Nigeria, November 20, 1972.

Speaker - Workshop on Cornell-KAIS Collaborative Activities, Ithaca, December 1, 1972.

Seminars - Foreign Service Institute, Department of State, Washington, D. C., December 3-6, 1972.

Lectures on employment - AID Retreat, Columbia, Md., December 12, 1972.

Paper - "Effect of Choice of Growth Strategies on Trade--Some Preliminary Thoughts," A/D/C Seminar on Trade, Agriculture and Development, University of Chicago, February 13-14, 1973.

Seminar - "Price Policies I: Agriculture," Economic Development Institute of the International Bank for Reconstruction and Development, March 19, 1973.

Paper - "Lessons to be Drawn From the Experience With Agriculture," AID Seminar on Science and Technological Considerations in National Planning of LDC's, Washington, D. C., April 30, 1973.

Seminar - "Employment Oriented Strategy for Economic Development," Department of Policy Planning and Regional Analysis, Cornell, May 2, 1973.

Paper - "Modernizing Agriculture and Theories of Economic Growth,"
Conference on Agriculture in Development Theory, Villa Serbelloni,
Bellagio, Italy, June 23-29, 1973.

Mudahar, H. S.

Paper - "A Dynamic Model of Agricultural Development with Demand
Linkages," A/D/C Seminar, "The Application of Recursive Decision Systems
to Agricultural Sector Analysis," November 1-3, 1972.

Poleman, T. T.

Addressed on subject of: 1) The Effect of Income on Nutritional
Levels in Ceylon, 2) Problems in Estimation of Energy Expenditures and
Caloric Requirements, Nutrition Society of Ceylon, July 22, 1972.

Consultant to Government of Sri Lanka (Ceylon) on Food and Agri-
cultural Policy, sponsored by FAO, July-August 1972.

Participant - Symposium on Vital Rate Monitoring, Clinical Research
Center of Great Britain, London, February 3, 1973.

Poleman, T. T. and Scott, H. R.

Paper - "Instrumentation Methods for Acquisition of Physiological
Data From Unrestrained Animals Including Man," American Society of Agri-
cultural Engineers, December 1972.

Robinson, K. L.

Participated and discussed - Agricultural Development in China,
Cornell Alumni University, July 7-8, 1972.

Consultant to staff - IITA, Ibadan, Nigeria, January 1973

Lectured for three weeks to faculty and research staff in agricultural
economics of Portugal, sponsored by Gulbenkian Foundation, May-June 1973.

Sisler, D. G.

Attended - Workshop on the Development Aspects of Logging and Wood,
Conference of the Agricultural Development Council, Information Network,
August 1972.

Stanton, B. F.

Lectured and prepared materials for Agricultural Projects Courses,
Economic Development Institute, IBRD, Washington, June-September 1972.

4. Expenditure Related to Objectives and Areas of Activity

Formal accounting of the use of funds by general objectives has not been attempted. In many respects the first three objectives are so closely related that it is difficult to make meaningful separations. Roughly 10% of the funding this year was used for visiting faculty and guest lecturers; 80% supported graduate assistants, overseas research, and domestic analysis of data and summary work. The remaining 10% was used for printing and publications.

IV. Impact of Grant Supported Activities in Developing Institutional Capabilities

Substantial interpretation of grant activity was included as part of Section III, Accomplishments. This section will attempt to summarize and review activities to date.

Faculty and students at Cornell look upon this 211(d) grant as an excellent mechanism to strengthen and build upon existing academic capacity within agricultural economics in the many facets of international agricultural development. It is the policy of the Department to encourage every Ph.D. student interested in economic development problems to participate in field research overseas in a cooperative venture with an agency of the host country, a university or international organization. Students must be actively involved in development of the specific project on which they work even though it is a part of a larger research enterprise developed by Cornell faculty or research workers at the host institution. The grant makes possible field visits by supervising faculty where necessary and appropriate. It stimulates use and concern for results at the location where the research was done. In this sense, it makes the educational experience of each Cornell student and his supervising faculty member

more meaningful. It expands the research horizons of the student who will be the future professional in his own country. Often it provides him a set of institutional contacts and relationships which he will use as soon as he completes his degree. It is now possible to document how this objective has been met in a number of different countries.

The grant has increased the knowledge and capacity of Department faculty who have supervised Ph.D. thesis research of foreign students, and hence involved them more directly in economic development issues. For example, Dr. Conneman, a production economist with no overseas experience, is now actively sought by a number of African students as thesis adviser. This stems from his initial work with Mr. Kolawole on his grant supported research. We still hope to provide a productive program for Conneman to visit Nigeria, Uganda, and Ethiopia in the coming year to supervise additional research by his African students. Dr. Forker, because of his experience and work in Turkey, is another faculty member with an increased knowledge of development issues and experience who serves more effectively as graduate teacher and adviser particularly in marketing and price policy.

The grant has made it possible to bring to Cornell teachers and scholars who complement existing faculty competence. This is of equal importance to faculty and graduate students. The faculty has now formulated a more formal procedure whereby visiting faculty will be sought and committed in a more systematic manner each term with appropriate courses and seminars scheduled well in advance. Professors Tomek, Allee, Mount, and Poleman are now working on this program. Dr. Mellor is negotiating with an Indian research scholar to join us during the spring

or fall term 1974. Dr. Randolph Barker, economist at the International Rice Research Institute, will be in residence at Cornell during the academic year 1973-74. Dr. K. L. Robinson is currently on sabbatic leave as senior economist at the International Institute of Tropical Agriculture, Ibadan, Nigeria, also for the academic year 1973-74.

Now that the College of Agriculture and Life Sciences at Cornell has completed its formal institutional relationship with the College of Agriculture, University of the Philippines as of June 30, 1972, the existence of this 211(d) grant provides additional stability in the field of agricultural economics for a commitment to research on economic development issues. Dr. Darrah's continuing work in the Philippines has provided an important continuing linkage with research in that country. The opportunity to pursue research issues in the field overseas can only be possible if vehicles with some degree of flexibility are available and wisely used.

V. & VI. UTILIZATION OF INSTITUTIONAL RESOURCES IN DEVELOPMENT AND OTHER RESOURCES FOR GRANT RELATED ACTIVITIES

In Section III, Accomplishments, no effort was made to carefully separate sources of funding except in the research category. The listing of students, publications, and faculty outreach indicates a wide range of activities supported by many agencies and groups. It is always difficult to catalog all of the sources of funding for research and teaching efforts for international agricultural development. The largest sources of support for work in agricultural economics at Cornell are: The State of New York for faculty and student salaries, clerical support, and library resources; US/AID through the research contract directed by Professor J. W. Mellor and this 211(d) grant; the Ford

Foundation through support of Dr. L. B. Darrah's work in the Philippines and unrestricted funds for graduate student research overseas and graduate assistantships; the Rockefeller Foundation for support of their graduate student fellowship holders studying at this university and support for their overseas research; USIA; Department of State in support of Dr. Mellor's lecture tour in Africa; the FAO in support of Dr. Poleman's work in Ceylon and Uganda; the Agricultural Development Council in support of graduate students for degree programs and faculty participation in workshops and programs; the World Bank for faculty consulting, graduate student summer employment, and overseas research support for one student; the USDA for two research projects and the seminar programs involving Turkish officials. It was this listing that was used in developing the budget estimates in Table 1. No effort was made to include the salary or other support for graduate students funded by their own national governments or special fellowship programs outside those listed.

The university library system at Cornell is one of the 10 best in the United States in terms of size of collections, support, new acquisitions and service. It is hard to state in real terms the contribution of this very substantial resource to students and faculty. It is supported in many ways in small measure from overhead set aside from contract research. At a time when university resources are under substantial pressure and library funds are no exception, we are very fortunate to continue to have such a fine system receiving high priority from endowed income funds. This is an important contributor to teaching and research within the Department.

VII. Next Year's Plan of Work and Anticipated Expenditures

Program emphasis will continue to be placed on graduate teaching, research on development issues at overseas locations, and mechanisms to provide outreach from completed research and study.

Five students are and will be supported at overseas field locations on continuing projects concerned with international trade, comparative advantage, employment generation in rural areas, market organization and appraisal of development in individual sectors on trade.

A research specialist has been hired to assist Professor D. G. Sisler with his program in international trade. This will provide continuity in the overall research effort as well as support individual graduate student efforts in developing proposals that contribute to the larger program.

A formal program to have a series of visiting faculty on a regular basis in the Department to teach is now in operation. Dr. Randolph Barker from the International Rice Research Institute is now in residence and will develop a new graduate course in production economics directed toward students in agronomy, plant breeding, and plant protection with major interest in international agricultural development. Dr. Barraclough is scheduled to lecture either in the summer session or fall term 1974. He is a senior FAO employee located in Chile.

A continuing effort will be made to publish at least one summary statement or research paper from each thesis completed with a central emphasis on economic development problems. These will be issued largely in the College IAD series, the Department's mimeographed research series, or in refereed Journals.

Table I

Distribution of 211(d) Grant Funds and Contributions From Other Sources of Funding

Review Period 7/1/72 to 6/30/73

Grant Related Activities	211(d) Expenditures				Non 211(d) Funding Amount (1972-73)
	Period Under Review	Cumulative Total	Projected Next Year	Projected to End of Grant	
Research	\$24,111	\$57,093	\$65,000	\$195,000	\$230,000
Teaching	1,930	6,133	5,000	20,000	135,000
Libraries	-----	-----	-----	-----	10,000
Mission Payments (Research)	1,215	4,087	5,000	13,000	
Consultation	-----	1,632	3,000	6,000	
Other	<u>329</u>	<u>775</u>	<u>2,000</u>	<u>6,000</u>	<u>25,000</u>
Total	\$27,585	\$69,720	\$80,000	\$240,000	\$400,000

9-10-73

Table II
 Expenditure Report
 (Actual and Projected)
 Under Institutional Grant #AID/csd - 2823
 Review Period 7/1/72 to 6/30/73

Line Items (to conform to budget in Grant document)	Expenditures to Date		Projected Expenditures				Total
	Period Under Review	Cumulative Total	Year				
			2	3	4	5	
Salaries	\$14,275.36	\$34,002.71					\$110,000
Travel	1,886.98	14,280.79					50,000
Equipment (Leases & Rentals)	830.02	934.46					2,000
Other	1,962.47	2,013.11					4,000
Overseas Research Expenses	2,639.21	7,788.29					36,000
Mission Payments	1,215.26	4,087.49					13,000
Computers	137.34	504.90					10,000
Printing	3,011.92	3,011.92					8,000
Tuition & Fees	<u>1,626.20</u>	<u>3,096.20</u>					<u>7,000</u>
Total	\$27,584.76	\$69,719.87					\$240,000