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ANNUAL REPORT
for
US/AID 211(d) Grant
1970-71

Introduction

It is our understanding that funds made available under the 211(d) grants by US/AID were designed to strengthen and expand existing competence and academic programs in the economics of agricultural development in departments of agricultural economics and related disciplines. In that context this statement should be viewed as a progress report reflecting work on programs already underway and providing particular attention to projected or existing activities for which the new grant funds are or will be used.

Staff and Faculty Commitment and Teaching

No new faculty members with primary interest or responsibility in international agricultural development have been added on a permanent basis during the academic year 1970-71. Primary teaching and research work in the area of international agricultural development is conducted under the leadership of Professors Freebairn, Mellor, Poleman, Robinson and Sisler. A number of other faculty direct graduate students and supervise thesis research concerned with the economics of agricultural development. Currently Professors David Call, George Casler, Howard Conklin, George Conneman, O. D. Forker, C. D. Kearl, T. D. Mount, B. F. Stanton and W. G. Tomek are actively involved with one or more students who are initiating or completing projects with substantial overseas components.

During the 1970-71 academic year three faculty members were on leave in overseas assignments. Professor L. B. Darrah is in the first of a two-year commitment at the College of Agriculture, University of the Philippines, Los Banos. He is

a member of the last group of faculty to go from Cornell to the Philippines as part of the graduate education and research program conducted during the past 10 years. Professor O. D. Forker has been on leave during the year as economic advisor to the AID mission in Ankara, Turkey. He has been concerned with agricultural price policy and market development research. Professor C. W. Loomis has spent his sabbatic leave as economic advisor to the Agricultural Development Fund of Iran in Teheran under World Bank sponsorship. Both Forker and Loomis will return to Cornell during August 1971.

Professor J. W. Mellor is on sabbatic leave during the academic year 1970-71 but located in Ithaca. He is working on a research project which will lead to a book published by the Twentieth Century Fund. The project concerns evaluation of the agricultural development process in India and the impact of new technology on rates of growth, differential rates of development in the several states and income distributions. Dr. Roger Selley has been working full time during the year with Professor Mellor on this project here in Ithaca.

Dr. Uma Lele served as a Visiting Assistant Professor at Cornell from February 1970 to February 1971. During this period she worked on Professor Mellor's contract on price policy and the new one concentrating on rural employment. She initiated a graduate seminar on agriculture and economic planning models (Ag. Ec. 669) in cooperation with Professor Mellor during the fall term 1970-71. This course will now be offered by Professor Mellor on a regular basis and is printed in the College Announcement for 1971-72. The announcement follows:

"Ag. Ec. 669. Seminar on Agriculture and Economic Planning Models. Spring term. Credit three hours. Prerequisite: basic macro-economics and quantitative methods. T 1:00-3:00. Warren 361. Professor 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."

A status report on instruction in agricultural economics which is part of the College's overall program in international agricultural development is prepared annually. The following statements from that report provide a current picture of course instruction and student activity at the graduate and undergraduate level.

1) Courses specific to International Agriculture

<u>Course No.</u>	<u>Title</u>	<u>Professor</u>	<u>Enrollment</u>	
			<u>Undergraduate</u>	<u>Graduate</u>
Ag Econ 150	The Economics of Agricultural Development	Sisler	380	14
Ag Econ 464	Economics of Agr. Development	Freebairn	17	8
Ag Econ 560	World Food Economics	Poleman	1	6
Ag Econ 637	Administration of Public Agricultural Programs	Lutz	2	2
Ag Econ 657	Seminar in Agr. Policy	Robinson	0	4
Ag Econ 664	Agricultural Development in South Asia	Selley	0	5
Ag Econ 665	Seminar on Latin American Agricultural Policy	Freebairn	3	3
Ag Econ 669	Agricultural and Economic Planning Models	Lele	0	7

2) Undergraduates with specialization in International Agriculture.

<u>Name</u>	<u>U.S.</u>	<u>Name</u>	<u>Foreign</u>	<u>Country</u>
Aho, Paul		Bleier, Christian		Colombia
Gordon, Peter		Geld, Steven		Brazil
Morse, Richard		Gutierrez, Carlos		Colombia
Vassar, David				
Wailles, Eric				
Wilson, Peter				

3) Present graduate students with major field in your department and with professional interest in International Agriculture - place asterisk to

right of name of those who have a minor in International Agricultural Development.

<u>U.S.</u>		<u>Foreign</u>		
<u>Name</u>	<u>Degree Sought</u>	<u>Name</u>	<u>Degree Sought</u>	<u>Country</u>
Beeghly, Weyland	MS	Anderson Marvin	PhD	Canada
Burton, William R.	PhD	Badillo, Arnaldo*	MS	Venezuela
Doering, Otto	PhD	Burger, Veit*	PhD	Austria
Ferguson, Donald S.	PhD	Cousins, Roger L.	MS	England
Levinson, Franklin J.	PhD	Desai, Bhupendra	PhD	India
Montgomery, Roger	PhD	Donovan, W. Graeme	PhD	New Zealand
Schultheis, Michael	PhD	Falusi, Abiodun O.	PhD	Nigeria
Shortlidge, Richard L., Jr.	PhD	Fernandez, Jaime	MS	Nicaragua
Small, Leslie	PhD	Fonck, Carlos	PhD	Chile
Swanberg, Kenneth	PhD	Girao, Jose A. B. J.	PhD	Portugal
		Korchitnet, Buranee	MS	Thailand
		Marukatut, Narong	MS	Thailand
		Nurse, Osborne	PhD	Trinidad (W.I.)
		Rahman, Radzuan	MS	Malaysia
		Ramirez, Pablo	MS	Chile
		Robertson, Charles	PhD	England
		Saleh, Hormoz	PhD	Iran
		Salem, Ali B.	PhD	Tunisia
		Schluter, Michael	MS	England
		Shillingford, John D.	PhD	Dominica
		Tadele, Tesfaye	MS	Ethiopia
		Tecle, Tesfai	MS	Ethiopia
		Vellin, J. L. Clovis	PhD	Mauritius
		Zulberti, Carlos	PhD	Argentina

3a) Graduate students who have been or are now abroad to collect thesis data.

<u>Name</u>	<u>Dates Abroad</u>		<u>Country</u>
	<u>From</u>	<u>To</u>	
Anderson, Marvin	Feb. 70	May 71	Brazil
Burton, William R.	Dec. 70	Jan. 72	Thailand
Doering, Otto	Dec. 69	Feb. 71	Malaysia
Kolawole, Michael	June 71	Jan. 72	Nigeria
Nurse, Osborne	Feb. 70	Sept. 70	Trinidad (W.I.)
Robertson, Charles	June 68	Aug. 70	Philippines
Saleh, Hormoz	Feb. 71	Oct. 71	Iran
Schultheis, Michael	Oct. 70	June 71	Uganda
Shortlidge, Richard L. Jr.	Feb. 71	Oct. 71	India
Small, Leslie	June 70	Dec. 71	Thailand

4) Graduate theses with international emphasis - completed since July 1, 1970.

<u>Author</u>	<u>Degree</u>	<u>Thesis Title</u>
Badjeck, Benjamin	MS	Increasing Productivity and Employment in Tropical Peasant Farming: The Case of the Guys Hill-Highgate Area, Jamaica, West Indies.
Greene, Brook A.	PhD	Rate of Adoption of New Farm Practices in the Central Plains, Thailand.
Levinson, Franklin J.	MS	Nutrition Intervention in Low Income Countries: Its Economic Role and Alternative Strategies.
Raquibuzzaman, Mohammad	PhD	An Economic Appraisal of the Sugar Policies of Developed Countries and the Implications of These Policies to Developing Nations.
Schroeder, Mark C. W.	PhD	The Impact of the Sonauli-Pokhara Highway on the Regional Income and Agricultural Production of Pokhara Valley, Nepal.
Shillingford, John D.	MS	Morphological Characteristics and Agricultural Performance of the Major Land Types in Dominica, West Indies.
Vellin, J. L. Clovis	PhD	A Full Employment Strategy for Agricultural Development in Mauritius.
Weiss, Joseph	PhD	The Benefits of Broader Markets due to Feeder Roads and Market News: Northeast Brazil.
Zulberti, Carlos	MS	The Economic Evaluation of Fattening Beef Cattle.

Special Seminars and Programs

Under the leadership of Professors Freebairn and Poleman, Cornell University sponsored a special workshop during the first week in June 1971 under the title, "Food, Agriculture, and Employment: The Social Impact of Modernizing Agriculture." This special program was sponsored by the Division on Science, Technology and Society within the university. Twelve papers were commissioned and discussants sought from the biological and social sciences concerned with the basic topic. Interaction and discussion were largely confined to the writers and discussants of papers and a small number of government, university and foundation representatives. Proceedings from the conference will be published by Cornell University Press. Professors Poleman and Freebairn are now editing the manuscripts. The papers presented at the workshop were as follows:

1. "Overview: Food and Population in Historical Perspective," Thomas T. Poleman, Department of Agricultural Economics, Cornell University.
2. "The Scope for Technical Progress in Agriculture," Robert F. Chandler, Director, International Rice Research Institute, Los Banos, Philippines.
3. "Food Needs and Effective Demand for Food," Joseph W. Willett, Director, Foreign Regional Analysis Division, USDA, Washington, D. C.
4. "Population Growth and Economic Development," Warren C. Robinson, Department of Economics, Pennsylvania State University.
5. "Demographic Consequences of Differential Growth." Parker Marden, Department of Sociology, Cornell University.
6. "Income Disparities in the Agricultural Sector: Regional and Institutional Stresses," Donald K. Freebairn, Department of Agricultural Economics, Cornell University.
7. "Conflict and Shifting Political Alignments in the Countryside," Francine Frankel, Center for International Studies, Princeton University.
8. "Industrialization and Employment," M. P. Todaro, The Rockefeller Foundation, New York.
9. "The Welfare Economies and Diseconomies of Scale," Jorge Hardoy, Centro de Estudios Urbanos y Regionales, Instituto Torcuato di Tella, Buenos Aires, Argentina.
10. "Demise of Comparative Advantage: The Impact on Trade," Daniel Sisler, Department of Agricultural Economics, Cornell University.
11. "Challenges to the Established National Political Order," Douglas Ashford, Department of Government, Cornell University.
12. J. P. Bhattacharjee, Deputy Director, Joint FAO/IBRD Investment Center, Rome, Italy, will serve as rapporteur.

Besides the usual departmental seminars and lectures provided by visiting faculty, scholars and Cornell scientists, two special programs were organized for one-week periods during January and March 1971. In each case a special set of lectures was established during a period when regular classes were not in session. The first set of lectures were given by Dr. J. P. Bhattacharjee, Deputy Director, FAO/IBRD Investment Center, Rome, Italy. His lectures concerned the functioning of the Investment Center, the development of projects within countries and the appraisal and analysis of development opportunities within agriculture from the perspective of FAO and the World Bank.

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The second set of lectures were prepared by Professor Benjamin I. Cohen, Economic Growth Center, Yale University. The series of topics associated with current research in international trade around which his lectures were developed were:

- | | |
|--|---|
| Monday, March 22
3:30 p.m.
Warren 401 | Commercial trade policies relative to developing countries. The focal point of this seminar will be the results of empirical work by Cohen, Ranis, Scitovsky and the OECD relative to the impact of import controls and possible results from lowering quantitative restrictions. |
| Tuesday, March 23
3:30 p.m.
Warren 401 | Multinational corporations in developing countries. An exploration of current thinking concerning the role that multinational firms play in the process of economic development. |
| Wednesday, March 24
3:30 p.m.
Warren 401 | Foreign aid to developing countries. A discussion of economic and technical aid to developing countries from the Soviet Union and the size and importance of multilateral aid. |
| Thursday, March 25
3:30 p.m.
Warren 401 | Effective tariffs. This seminar will be based on Professor Cohen's forthcoming article in the <u>Journal of Political Economy</u> which discusses the use and abuses of the concept of effective tariffs. |
| Friday, March 26
10:10 a.m.
Warren 401 | A theoretical analysis of partial economic reform in a developing country. A discussion of a computer simulation model which analyzes the impact of planned economic reform in a two sector, four input economy. |

Both faculty and graduate students within and outside the department were enthusiastic about this approach to interaction with an outside scholar. The visit in both cases was long enough so that both students and faculty could have time with the visitor to discuss substantive issues. A set of lectures provided a basis for some true intellectual impact. It allowed us to bring someone to the campus whom we could not have brought for a term or to teach a formal course. We plan to use this kind of format in bringing other lecturers to the campus if at all possible in subsequent years.



International Linkages in Research and Teaching

Two men, not employed by Cornell University but formerly faculty members in the department, continue as members of the Cornell University Graduate School and hold courtesy appointments within the department. They are Dr. Randolph Barker, International Rice Research Institute, Los Banos, Philippines and Dr. Solon Barraclough, Director, Instituto De Capacitacion E Investigacion En Reforma Agraria (ICIRA), Santiago, Chile. Each of these men provide leadership and guidance for graduate students working on dissertation topics related to their own research programs. Professor Barker visited Ithaca in June 1971 and participated in the workshop mentioned earlier in this report. He will supervise the work of two new graduate students on projects located in the Philippines during the coming academic year. These projects are also coordinated with the University of the Philippines-Cornell University Program which will be completed formally in 1972.

Professor Barraclough will teach for six weeks in the Cornell University Summer Session during July and August 1971. His course is part of a special Latin American Studies Program offering. Approximately 25 students from agricultural economics and related disciplines are taking this course offering. Dr. Barraclough continues to serve as thesis advisor to Chilean and American students working on Ph.D. topics involving Chilean and Andean materials.

Visiting scientists or scholars who were in residence in Ithaca for more than one month during the past academic year were:

<u>Name</u>	<u>Cornell Position</u>	<u>Country</u>	<u>Dates</u>
Lele, Dr. Uma J.	Visiting Asst. Prof.	India	2/70 - 3/71
Rahmani, Dr. M.	Visiting Fulbright Research Scholar	Iran	1/70 - 12/70
Sakura, Dr. Seiji	Visiting Fellow	Japan	9/70 - 9/71
Selley, Dr. Roger A.	Visiting Asst. Prof.	U. S.	9/70 - 6/71
Raquibuzzaman, Dr. M.	Research Technician	Pakistan	4/71 - 6/71

Faculty maintain working relationships with a number of scientists in developing countries. The locations presented earlier in this report for graduate

students working on Ph.D. thesis projects overseas all involve some kind of formal or informal relationship with a host university, government agency or foundation. Two of the students, Michael Kolawole and Hormoz Saleh, are funded with 211(d) grant monies. In these cases, as in all the others, a host country counterpart person is involved in supervision and collaboration on the research endeavor. It is basic policy for the department to involve Ph.D. students with central interest in development in a research problem in a developing country if funding and support can be found. In most cases students work in locations where relationships have been established with faculty and former students.

Research Projects and Publications

Formal research involving student and faculty effort in international agricultural development during the academic year 1970-71 was done under the following titles:

- Hatch 005 Analysis of Price-Demand-Supply Structures for Farm Products (W. G. Tomek, K. L. Robinsome and T. D. Mount)
- Hatch 028 Role of Agricultural Trade in the Process of Economic Development (D. G. Sisler and K. L. Robinson)
- State 510 Mexican Agricultural Policy (D. K. Freebairn)
- State 511 Cost and Economic Effects of Alternative Policies Designed to Improve Farm Incomes (K. L. Robinson)
- State 512 Evaluation and Improvement of Tropical Agricultural Statistics (T. T. Poleman)
- State 513 Agricultural Implications of Rapid Urbanization in the Tropics (T. T. Poleman)
- State 514 Economics of Tropical Agricultural Commodities (T. T. Poleman)
- State 515 Economics of Pioneer Settlement in the Tropics (D. K. Freebairn and T. T. Poleman)
- State 814 Impact of New Agricultural Technology on Rural Employment and Income (J. W. Mellor)
- State 851 Resource Productivity and Output Response in Latin American Agriculture (D. K. Freebairn)

Support for these research endeavors came from State, Federal, Contract and Grant income. Students were encouraged to obtain fellowship support wherever possible. The title of the formal project and the numbering does not indicate the principal source of funding but follows local experiment station policy.

Publications during the academic year resulting from research on international problems are listed below exclusive of theses.

Bawa, Ujagar S., "Agricultural Production and Industrial Capital Formation, India, 1951-52 to 1964-65," Cornell Int. Agr. Development Bulletin 17, Mar. 1971

Beeghly, Weyland and Poleman, T. T., "Beer Cans and Babies: A Graphic Essay Comparing Their Impact on the Environment," Agr. Econ. Staff Paper No. 29, Mar. 1971.

_____, "Forecasting Changes in Human Energy Expenditure Associated with Agricultural Development: A Sampling Procedure for the Dry Zone of Ceylon," Agr. Econ. Staff Paper No. 27, Jan. 1971.

Echeverria, Roberto P., "The Effect of Agricultural Price Policies on Intersectoral Income Transfers," Occasional Paper No. 30, Cornell University, Department of Agricultural Economics, USAID Prices Research Project, Oct. 1970.

Greene, Brook A., "Use of Fertilizer in Amphoe Manorom, Changwat Chainat, Thailand, 1967-1969," Occasional Paper No. 36, Cornell University, Department of Agricultural Economics, USAID Prices Research Project, July 1970.

Horowitz, Grace, "Capital-Labor Ratios, Capital-Output Ratios, and Rates of Profit in Indian Industry," Occasional Paper No. 44, Cornell University, Department of Agricultural Economics, USAID Employment and Income Distribution Project, Feb. 1971.

Lele, Uma J., "An Analysis of Modernization of the Rice Milling Industry in India," Occasional Paper No. 37, Cornell University, Department of Agricultural Economics, USAID Prices Research Project, July 1970.

_____, "Modernization of the Rice Milling Industry, Lessons from Past Performance," Economic and Political Weekly, Vol. V., No. 28, July 11, 1970.

Mellor, John W., "Agricultural Prices in Economic Development - Their Role, Function and Operation," Occasional Paper No. 39, Cornell University, Department of Agricultural Economics, USAID Prices Research Project, Oct. 1970.

_____, "The Basis for Agricultural Price Policy," War on Hunger, A Report from the Agency for International Development, Vol. IV, No. 10, Oct. 1970.

_____, "Accelerated Technological Change in Agriculture and Its Relation to Environment," Cornell Agr. Econ. Staff Paper No. 21, Nov. 1970.

Mellor, John W., "The Agricultural Marketing System and Price Stabilization Policies," Cornell Agr. Econ. Staff Paper No. 26, Dec. 1970.

_____, review of: Kazushi Ohkawa, Bruce F. Johnston and Hiromitsu Kaneda, Ed., Agriculture and Economics Development: Symposium on Japan's Experience, University of Tokyo Press, 1969, pp. 433, reprinted from The Economic Review, Vol. 21, No. 2, Tokyo, Japan, May 1970.

_____, "Elements of a Food Marketing Policy for Low Income Countries," Cornell Int. Agr. Development Reprint 45, reprinted from The Marketing Challenge: Distributing Increased Production in Developing Nations, Foreign Economic Development Report 7, Dec. 1970.

_____, "Determinants and Development Implications of Foodgrains Prices in India, 1949-1965," American Journal of Agricultural Economics, Vol. 50, No. 4, Nov. 1968, reprinted in the Nobiyuku Nogyo (Growing Agriculture), No. 322, 1970.

Mellor, John W. and Moorti, T. V., "Dilemma of State Tube Wells," Economic and Political Weekly, Vol. VI, No. 13, Mar. 27, 1971.

Moorti, T. V., "A Comparative Study of Well Irrigation in Aligarh District, India," Cornell Int. Agr. Development Bulletin 19, May 1971.

Nightingale, Ray W., "The Modernization Decision in Indian Urban Fluid-Milk Markets," Cornell Int. Agr. Development Bulletin 15, 1969.

Poleman, T. T., "Food and Population in Historical Perspective," Cornell Agr. Econ. Staff Paper No. 32, May 1971.

Poleman, T. T. and Heywood, P. F., "Explorations in the Use of Heart Rates as a Predictor of Energy Expenditure," Cornell Agr. Econ. Staff Paper No. 12, July 1970.

Schroeder, Mark and Sisler, Daniel G., "The Impact of the Sonauli-Pokhara Highway on the Regional Income and Agricultural Production of Pokhara Valley, Nepal," Occasional Paper No. 32, Cornell University, Department of Agricultural Economics, USAID Prices Research Project, June 1970.

Schultheis, Michael J., "The Statistics of the World Food Problem: A Review Essay," Cornell Agr. Econ. Staff Paper No. 15, July 1970.

Silos, Jose S. and Freebairn, Donald K., "El Valle del Yaqui, Sonora. Su desarrollo agricola utilizacion de recursos y potencial economico," Colegio de Postgraduado, Chapingo, Mexico, 1970.

Sisler, Daniel G., "International Trade Policies and Agriculture," Paper presented at XIV International Conference of Agricultural Economists, Minsk, U.S.S.R., August 24 to September 2, 1970.

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Plan of Work

During the 1970-71 year relatively little money from the 211(d) grant was spent. This reflected 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. Two foreign students, one from Iran and the other from Nigeria, are now working on Ph.D. research topics in their home countries supported by 211(d) funds. Mr. Saleh in Iran is working under the direction of Dr. D. G. Sisler. His research is a contribution to Sisler's overall efforts in the area of international trade. A copy of Saleh's sub-project is appended to this report. Dr. Clyde Hudson is the cooperating scientist in Iran providing support leadership for the student's work. Mr. Kolawole has started work on a mechanization project in Nigeria under the direction of Professor G. J. Conneman at Cornell. Mr. Kolawole is a faculty member at the University of Ife but will also receive help from Dr. Hedley at the International Institute of Tropical Agriculture, Ibadan. Both students plan to return to Ithaca during the spring term 1972 to complete the analysis of their research materials and write their theses.

Professor Barraclough's lectures during the Summer Session at Cornell are supported by funds from this project. A copy of the announcement for the program is attached. During the coming academic year we plan to seek approval for two other visiting scholars to come to Ithaca for periods of one or two weeks to lecture and give seminars. The format followed by Cohen in 1971 will be followed.

Professor D. G. Sisler is interviewing candidates for a research associate position for a two or three-year period to assist him in his research in international trade. Plans for this research effort have been reviewed with Dr. Coutu in TAB, US/AID and encouragement given for this kind of expanded research effort. Associated with this project two new Ph.D. students will be supported with 211(d)

funds for the fall term. One is a student from Nepal, the other an American concerned with trade problems. A significant portion of the 211(d) project expenditures during 1971-72 will be associated with Professor Sisler's research and graduate student program.

One other project area scheduled for research support during the coming year is the energy expenditure research program directed by Professor T. T. Poleman. A sub-project in which Dr. Randolph Barker at IRRI would be a collaborator is planned for 1971-72. A draft of the sub-project is attached describing the basic framework and cooperation planned with the Food and Nutrition Research Center of the Philippine Government. Approval for travel and support for Dr. Poleman and one graduate student associated with this project will be sought.

Interaction between research sponsored under the contract directed by Dr. John W. Mellor (US/AID c.s.d. 2805) and this project to increase capability of the faculty and students at Cornell University in work in international agricultural development will be strongly encouraged. Emphasis on sector analysis and employment issues will be given to work directed by Professor Mellor. Work on international trade, resource productivity and market structure and development will be associated with this project and other international project funding.

July 1971

CORNELL UNIVERSITY AGRICULTURAL EXPERIMENT STATION

SUB-PROJECT TO HATCH PROJECT NO. 028

Title: The Demand for Red Meat, Poultry and Fish in Iran

Location: Ithaca, New York and Teheran, Iran

Leaders: Professor Daniel G. Sisler, Project Leader
Hormoz Saleh, Graduate Assistant

Cooperators: Department of Agricultural Economics, Cornell University,
U. S. Agency for International Development and F.A.O. Market
Research Team in Iran

Justification: At present, the population of Iran is growing at an annual rate of nearly 3 percent. The Central Bank of Iran estimates that during the 1955-69 period per capita income rose by 4.4 percent annually. The combined forces of increasing income and population have greatly increased the demand for meat in Iran. Meat prices, particularly lamb, mutton and beef, spiraled upward until the government found it necessary to impose price controls. In 1964 the value of livestock products exported from Iran was \$9.3 million greater than the value of livestock products imported. Only five years later this surplus had changed to a \$9.1 million deficit.

The trend in international trade in livestock products and the upward pressure on livestock prices emphasize the importance of knowledge relative to the future demand for meat and fish in Iran. If rational policies are to be formulated relative to international trade, price regulation and measures which increase domestic production, it is of great importance that additional information be gathered relative to the future demand for meat and fish in Iran. Considerable thought must also be given to the best strategy to meet this demand.

Objectives: The main theme of this research is an examination of data relating to the forces which influence the demand for meat in Iran. Specifically the objectives are:

1. To collect data relative to factors relating to the demand for beef, lamb, mutton, poultry and fish. Such indicators as population, per capita income, income distribution, and prices will be obtained from published reports.
2. To extrapolate data from the 1957-70 period forward to provide estimates of meat consumption through 1980.

3. To determine the most efficient techniques for meeting anticipated meat and fish requirements. Particular emphasis will be given to the potential of increased domestic sheep production, and the role of imported chilled and frozen meat.
4. To determine the inefficiencies associated with current practices of transporting, slaughtering, and distributing sheep in the Teheran market.
5. To evaluate the consumer acceptance of marketing practices such as improved grading standards and the introduction of frozen meat.

Methodology:

Statistics relating to population, income and imports of meat will be gathered from the Central Bank of Iran, the Ministry of Finance, and the Ministry of Standards. Two techniques for estimating production and consumption of red meat will be followed. First, a sample of slaughter houses will be visited, and information will be gathered as to number of animals slaughtered per year, and average slaughter weight. These data will then be used to compute total slaughter in organized slaughter houses of Iran. Secondly, accurate records are available as to the number of hides tanned and processed annually. These hide numbers, together with carcass weights, will be used to determine total slaughter.

Household consumption surveys have been conducted by the Statistical Center of Iran and the Central Bank of Iran. These studies provide data for the 1963-69 period, but the information is mainly for larger urban centers. A survey will be conducted in a small village in northeastern Iran. It is hoped that this survey will provide information concerning the pattern of meat consumption in rural Iran.

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TO: Graduate Students and Faculty in Agricultural Economics
FROM: B. F. Stanton and D. K. Freebairn
SUBJECT: Summer Session Course on Agrarian Reform being offered by
Visiting Professor Solon Barraclough

As a number of you know, Solon Barraclough will offer a seminar on Agrarian Reform during the six-week Summer Session for July 1 - August 13. The seminar is one of several courses in a special summer teaching program sponsored by the Latin American Studies Program. The course title and description:

Agricultural Economics 666. Mr. Solon Barraclough. Seminar on Latin American Agrarian Reform. (U,G). 4 credits. Monday through Friday, 9:30 - 10:45. Goldwin Smith 160. July 1 - August 13. The seminar will review the literature on the relationship between land tenure structure and economic development in Latin America, with comparisons to agrarian problems in other parts of the world.

Although the seminar will have some focus on Latin American materials, Mr. Barraclough has indicated that he would welcome students who have interest and experience on other world areas. Contrary to earlier announcements, Mr. Barraclough has indicated that Spanish or Portuguese will not be required. The Agricultural Economics Department is sponsoring the seminar and has been able to make arrangements which will permit its graduate students to enroll with a special dispensation of tuition for this course only. If you would like to know more about the seminar or would like to make arrangements for enrolling, please see Donald Freebairn (205 Rand in the morning or 349 Warren in the afternoon) by Tuesday, June 29.

Randy Barker
May 1971

DRAFT

LABOR INPUTS AND ENERGY REQUIREMENTS FOR
RICE PRODUCTION - A PROPOSED STUDY

The introduction of new rice technology coupled with growing unemployment problems in Asia has increased the need for information on labor requirements for specific systems of rice production. Rice is grown under upland, rainfed (lowland, non-irrigated) and irrigated conditions. In general, more labor per hectare is employed and higher yields obtained under irrigated culture. The new seed-fertilizer technology increases the productivity of labor. However, the introduction of mechanization makes it possible to reduce labor requirements for some tasks and increase the efficiency of labor use. Whether or not such labor saving techniques are practical and profitable depends in part on the benefits from more timely operations and in part on the opportunity for employment of labor saved in profitable alternatives.^{1/} As technology changes, basic food requirements will also change. Measuring this change will be of major interest to those concerned with nutrition requirements at the national level.

The development of the SAMI makes it possible to measure the energy (calorie) input for specific tasks by monitoring the heart beats of a farmer during the period when he is working.^{2/} Using this technique, and estimating the time required to accomplish a specified amount of work, would make it possible to determine not only the labor input, but the actual energy input in rice production. It would be possible to measure the labor and energy requirements for specific systems of rice production--upland, rainfed, single-crop irrigated, double-crop irrigated.

It would also be possible to measure these requirements for alternative methods of performing the same task.

This proposed joint study involving the International Rice Research Institute, the Food and Nutrition Research Center of the Philippines, and Cornell University would have two objectives:

1. Determine labor and energy requirements for two systems of lowland rice production, rainfed, and irrigated.
2. Determine labor and energy requirements for alternative methods of performing the same task as indicated below:

<u>Task</u>	<u>Alternative Methods</u>
1. Land preparation	
a. plowing	Carabao vs. hand tractor vs. 4-wheel
b. harrowing	tractors
2. Pulling seedlings	Dapog vs. wet bed
3. Planting	
a. transplanting	Straight row vs. conventional Dapog vs. wet bed
b. row planting	Row seeder vs. hand method
c. broadcasting	Hand method
4. Weeding	Mechanical vs. hand vs. weedicide
5. Threshing	Machine thresher vs. peddle thresher vs. hand threshing

Rainfed and irrigated rice is being grown in Laguna and with one or two exceptions, the techniques described above are all being practiced locally. Thus, it would be possible to obtain a sample of farm workers with very little difficulty.

In achieving the first objective it is hoped that personnel from IRRI and the Food and Nutrition Research Center could work together to

study the same sample farmers. The second objective could be accomplished cooperatively by Agricultural Economics and Agricultural Engineering at IRRI.

The study would be conducted over a six-month period, the bulk of the observations being made during a period of three months when Dr. Thomas Poleman of Cornell would be on hand to act in a supervisory capacity. Because of the staggered nature of planting and harvesting in Laguna, it is anticipated that all observations for the irrigated farms could be completed in three months. However, a longer period would probably be required on rainfed operations where planting occurs after the monsoon rains begin.

A methodology will have to be agreed upon so that adequate data on can be obtained on labor and energy inputs for the entire rice growing process with the personnel that can be made available by the parties participating in the project.

Under this joint project, the participants would contribute as follows:

	<u>IRRI</u>	<u>Food & Nutrition Research Center</u>	<u>Cornell</u>
Technical Supervision	x	x	x
Field Personnel	x	x	
SAMI's			x
Gas Analyzer		x	
Transportation	x		