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Second Progress Report
on
Participating Agency Agreement
between
The Agency for International Development
and
The Economic Research Service
for analysis of
FACTORS ASSOCIATED WITH DIFFERENCES AND CHANGES IN AGRICULTURAL PRODUCTION IN UNDERDEVELOPED COUNTRIES

BY

Development and Trade Analysis Division
Economic Research Service
United States Department of Agriculture

June 1964

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Appendix I: Notes on AID Advisory Committee Meeting, December 17, 1963.

Appendix II: Notes on AID Advisory Committee Meeting, June 10, 1964.

Appendix III: Minutes of Second Meeting of AID Technical Advisory Committee, May 22, 1964.

Appendix IV: Draft Outline for Report on Increasing Agricultural Output and Productivity in Underdeveloped Countries.

This report describes progress made during the second six months of the project, plans for completing the comparative analysis in phase A, and plans for initiating phase B of the project. For background on the origin, development and staffing of the project, reference should be made to the first semi-annual report, November 1963, and to the Participating Agency Agreement No. 12-17-0017-132.

I. Progress During Second Six Months

As indicated in the first semi-annual report, the main effort during the first year of the project was an analysis of the developmental processes in individual countries, the assembly of available data and information, and visits to selected countries. Reports have been prepared for several countries in addition to those for Japan and the United States. Countries and authors of reports are as follows: Greece and Mexico, Clarence Moore; Nigeria and Liberia[1/], Steven Breth; Egypt and Sudan, Jiryis Oweis; Argentina, Jane Turns; Philippines, Harold Yee; Yugoslavia and Spain, Dwight Gadsby; and Turkey, Elbert Hendrix. In addition to their overall contribution to the project, some of these reports will be duplicated for use as basic resource material at an AID supported conference on problems of improving agricultural productivity in less developed countries which is being sporsored by MIT from June 27 to August 8 (see below for details of conference).

1/ Liberia was substituted for Ivory Coast as one of the 30 study countries after the project was underway.

A report on the growth and development of United States agriculture, "How the United States Improved Its Agriculture," ERS-Foreign-76, by R. P. Christensen, W. E. Hendrix and R. D. Stevens was released in March 1964. It provides an excellent description and explanation of the course followed by U.S. agriculture in achieving its high rates of output and productivity and should serve as an interesting example of how one country achieved agricultural abundance.

A book, Agricultural Development in Modern Japan, Takekazu Ogura, editor, was published in 1963 by the Fuji Publishing Company, Tokyo, Japan, as an outgrowth of the contribution made by Japan to the Freedom from Hunger Campaign. A part of the book was submitted as a paper for discussion at the World Food Congress held in Washington, D.C. in June 1963. This was later enlarged to encompass a survey of the modern history of the development of Japanese agriculture under the sponsorship of the Japan FAO Association. ERS personnel participated in the conference on Japanese Agricultural Development convened to review research findings on Japan and to prepare a chapter on implications for other developing countries. The publication will serve as the country report for Japan.

In addition to individual country write-ups, much data and information has been compiled for all study countries on items pertinent to the analysis of factors associated with differences and changes in agricultural production in underdeveloped countries. A partial listing of information being recorded includes the following: gross national product; total agricultural output, with a breakdown by major crops and by commercial, subsistence, and export sectors where possible; land inputs and irrigated

area; inputs associated with improved practices such as fertilizer, pesticides, improved seeds, and machinery; capital investments; demographic data; educational levels and literacy rates; public investments in the agricultural sector for research, extension, irrigation and other infrastructure; and institutional factors such as land tenure, credit, tax systems, and government at local and national levels. Because of the difficulty of quantifying much of the data relative to institutional factors, qualatative information is being gathered to supplement whatever numerical data are available.

Also as an outgrowth of the project an article, "The Mechanics of Agricultural Productivity and Economic Growth" by Raymond P. Christensen and Harold Yee will be published in Agricultural Economics Research, July 1964.

II. Production Indices

As mentioned in the plan of work in the Participating Agency Agreement indices have been computed for aggregate agricultural output as well as for output of major crops and groups of crops as the basis for determining rates of increase in output and productivity.

Although it was planned that aggregate agricultural output indices would be calculated, data on livestock production and numbers are limited so that for many countries only a crop production index is being computed. The exclusion of livestock production is not a serious omission for the majority of the countries included in Phase A, for at the present time crops account for more than 75 percent of total agricultural output in these countries. In countries like Argentina and Mexico where animal output is important, sufficient data exist to compute an index of livestock production and to incorporate it into an overall index of agricultural output. Output indices and rates of growth are presented in Tables 1 & 2.

Table 1.-- Total crop production. Index numbers for selected countries, 1948-1963 1/
(1957-59 = 100)

	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963
Latin America																
Argentina.....	88	83	77	60	98	91	107	77	105	91	107	101	86	99	96	NA
Brazil.....	67	67	74	72	72	76	81	88	81	92	96	112	108	118	115	NA
Chile.....	81	78	73	74	77	84	84	88	91	89	108	102	106	105	102	NA
Colombia.....	75	83	77	70	90	87	91	88	80	87	107	107	111	104	106	NA
Costa Rica.....	72	69	67	71	93	91	97	82	91	94	101	105	121	123	123	NA
Mexico.....	48	54	60	62	61	67	80	89	87	94	107	99	106	109	116	118
Venezuela.....	68	72	69	77	85	95	84	94	104	103	99	98	118	119	136	NA
Africa																
Nigeria.....	NA	NA	NA	NA	86	88	89	95	95	98	100	102	112	110	115	11[illegible]
Sudan.....	42	50	58	54	62	69	75	90	105	76	105	119	104	157	130	NA
Tanganyika.....	64	55	60	61	78	73	81	89	90	94	99	107	102	99	107	114
Tunisia.....	55	110	67	55	84	92	85	57	94	81	126	92	112	57	72	NA
Europe																
Greece.....	56	83	61	77	65	86	87	85	93	101	95	104	90	114	96	NA
Poland.....	77	85	92	78	82	81	90	87	96	99	99	101	108	123	106	118
Spain.....	70	72	72	100	94	85	96	88	89	96	98	107	99	103	NA	NA
Yugoslavia.....	NA	NA	52	77	49	82	65	81	62	102	80	118	103	98	96	104
Near East & So. Asia																
Egypt.....	87	85	81	80	89	82	91	88	88	97	99	104	108	89	116	NA
India.....	NA	NA	74	78	81	92	91	94	95	95	100	105	112	115	113	113
Iran.....	63	70	78	70	77	84	85	83	87	99	99	102	97	105	102	117
Israel.....	33	31	42	41	50	72	73	73	86	89	105	106	88	106	120	124
Pakistan.....	NA	NA	NA	NA	94	89	93	89	99	99	97	105	109	116	112	1[illegible]
Turkey.....	58	53	62	77	87	98	83	88	94	95	102	102	106	104	108	1[illegible]
Far East																
Japan.....	77	77	80	80	86	75	83	102	94	97	99	103	106	105	105	98
Philippines.....	55	59	63	73	75	83	89	92	93	97	99	104	108	107	120	127
Taiwan.....	56	66	72	71	77	84	85	84	91	96	102	102	103	110	108	112
Thailand.....	72	73	78	87	81	96	81	97	108	90	102	108	128	131	136	NA

1/ Estimates of crop production prepared from official country data, reports of U.S. Agricultural Attaches, and other sources by Regional Analysis Division, Economic Research Service. Includes tree crops and all other except forage crops. Data for some recent years are preliminary. NA indicates data not available.

United States Department of Agriculture, Economic Research Service.

TABLE 2.- COMPOUND ANNUAL GROWTH RATES IN TOTAL CROP PRODUCTION, POPULATION, AND CROP PRODUCTION PER CAPITA, 1948 to 1963 and 1955 to 1963 1/

Country and region	Total crop production			Population growth 2/	Annual compound rate of change in crop production per capita assuming current population growth and change in crop production at		
	1948-1963	1948-1955	1955-1963		1948-1963 rates	1948-1955 rates	1955-1963 rates
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Latin America							
Argentina	1.6	1.7	1.1	1.7	-0.1	0.0	-0.6
Brazil	4.6	3.7	5.3	3.1	1.5	0.6	2.1
Chile	2.9	1.8	2.6	2.3	0.6	-0.5	0.3
Colombia	2.8	2.6	4.0	2.9	-0.1	-0.3	1.1
Costa Rica	4.4	4.6	6.3	3.9	0.5	0.7	2.3
Mexico	6.4	8.5	3.9	3.1	3.2	5.2	0.8
Venezuela	4.6	5.0	4.6	3.4	1.2	1.5	1.2
Africa							
Nigeria	3.1	3.4	2.9	2.0	1.1	1.4	0.9
Sudan	9.4	10.2	7.2	2.8	6.4	7.2	4.3
Tanganyika	4.7	6.4	2.8	1.8	2.9	4.5	1.0
Tunisia	1.3	3/	3/	2.1	-0.8	3/	3/
Europe							
Greece	3.6	4.7	1.9	0.9	2.7	3.8	1.0
Poland	2.8	1.0	3.4	1.8	1.0	-0.8	1.6
Spain	2.6	4.0	2.8	0.8	1.8	3.2	2.0
Yugoslavia	5.0	6.1	3.8	1.1	3.8	5.0	2.7

1/ Compound annual growth rates computed from beginning to ending points of linear trend lines for period designated. Where data were not available for years at beginning or end of the periods, growth rates are for the years for which data were available as indicated in Table 1.

2/ Current rates as reported in AID Economic Data Book, Statistics and Reports Division, Agency for International Development.

3/ Not significant.

continued on next page.

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TABLE 2.- COMPOUND ANNUAL GROWTH RATES IN TOTAL CROP PRODUCTION, POPULATION, AND CROP PRODUCTION PER CAPITA, 1948 to 1963 and 1965 to 1963 1/

Country and region	Total crop production			Population growth 2/	Annual compound rate of change in crop production per capita assuming current population growth and change in crop production at		
	1948-1963	1948-1955	1955-1963		1948-1963 rates	1948-1955 rates	1955-1963 rates
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Near East & So. Asia							
Egypt	2.1	0.7	2.9	2.5	-0.4	-1.8	0.4
India	3.3	5.3	2.9	2.4	0.9	2.9	0.5
Iran	3.5	3.8	3.4	2.5	1.0	1.3	0.9
Israel	10.0	15.9	5.6	3.5	6.2	12.0	2.1
Pakistan	2.5	-0.1	3.1	2.2	0.3	-3.3	0.9
Turkey	4.4	8.0	3.3	2.9	1.5	5.0	0.4
Far East							
Japan	2.4	3.0	0.7	1.0	1.4	2.0	-0.3
Philippines	5.3	8.1	4.0	3.2	2.0	4.7	0.8
Taiwan	4.2	5.4	3.3	2.9	1.3	2.4	0.4
Thailand	4.6	3.9	5.7	3.1	1.5	0.8	2.5

NOTE: Footnotes 1, 2 and 3 are on the first page of Table 2.

III. Country Visits

In line with the plan of work for Phase A, about 20 study countries have been visited. Elbert Hendrix visited Iran, Turkey and Greece in October 1963; Wade Gregory, in connection with a trip to FAO, stopped in Tunisia and Spain in March 1964; Steven Breth visited Nigeria, Liberia and Ghana, and Harold Yee and Arthru Mackie visited the Philippines, Thailand and Malaya in April 1964. Also in April, Jiryis Oweis and George Westcott visited Egypt and Jordan with Oweis going on to Sudan and Tunisia and Westcott to Israel, Iran, Pakistan and India. In June, Dwight Gadsby went to Brazil, Argentina and Chile.

As indicated in the plan of work, these trips were made for the purposes of (a) checking upon and further developing parts of the study pertaining to these countries, (b) exploring into the possible uses of the study in development programs, and (c) inquiring into the advantages and disadvantages of these countries for the more intensive research planned in Phase B.

IV. Progress and Plans for Work with FAO

A brief progress report covering work done through December 31, 1963, was received from FAO in early February 1964. It noted that efforts were largely spent in collecting material and preparing "international tables containing statistical and other factual information on a particular aspect for all the countries listed for study." Preliminary tables for several factors were included with

the report. Progress has not been as rapid as anticipated due to problems of recruiting professional personnel. Work began on the project in September 1963 instead of June 1963 as originally scheduled and then the project began without the services of a project leader; to date this post still remains vacant.

During the last of February, Wade Gregory traveled to Rome to discuss with FAO officials progress and future plans for completion of work being carried out under the ERS contract with FAO. Steps taken to recruit a senior economist familiar with FAO files and problems of underdeveloped agriculture who could work with FAO during the summer 1964 have not been successful. This post will remain unfilled. FAO indicated that more time than originally planned would be needed to round out their analysis of the data collected and for that reason requested an extension of the contract to December 31, 1964. This request was granted.

V. Seminars

As a means of stimulating thought and exchanging ideas, several seminars have been held to discuss methodology and plans for carrying out Phase A and the meaning and significance of findings. Clarence Moore reviewed highlights of Greek agricultural development during the 1950's followed by a general discussion of the implications of the Greek experience to the developmental process. In another seminar Harold Yee and Raymond Christensen presented basic economic data on the Philippines followed by a discussion lead by Erven Long on how the results from this project could be most useful to AID. Bruce F. Johnston, Food Research Institute, Stanford University, led another discussion on agricultural development and the structural

transformation of a developing economy. Two seminars were led by Elbert Hendrix: The first related to the general objectives of the project, the kinds of data needed and available, and ways to use these data to maximum advantage. The second centered around the development of an outline for use in reporting on comparative analysis of changes in agricultural output and productivity in the 30 study countries. The experiences of Yugoslavia relative to the efficiency and productivity of the socialist sector versus privately operated farms was the topic of another seminar led by Dwight Gadsby. Harold Yee and Arthur Mackie discussed findings from their trip to the Philippines, Thailand and Malaysia in which they pointed out some factors associated with output changes and threw out for discussion various ideas explaining stagnation and changes needed for accelerating economic growth. In the discussion of his trip to Nigeria, Liberia and Ghana, Steven Breth centered his comments around the influence of geographical, historical and cultural factors on agricultural development and the way in which they were tampered by economic variables. Jiryis Oweis reported on development problems of the Arab world as viewed from his trip to Egypt, Jordan, Sudan and Tunisia.

VI. AID Advisory Committee

The AID/W Advisory Committee met with personnel from USDA to discuss the status of the project on December 17, 1963, and again on June 10, 1964. Notes from these meetings are included as Appendices I and II.

VII. Plans for Completing Phase A

An outline for a report of Phase A has been prepared and is included as Appendix IV. This report will cover research findings under Phase A of the project. It will give primary attention to a comparative analysis of changes and trends in agricultural output and productivity and of the technological, economic, and institutional conditions associated with these changes for the 30 countries included in the study.

In addition to the comparative analysis of the above mentioned factors, special attention will be given to several specific areas. One of these relates to the use of improved practices, particularly fertilizer, and their role in increased agricultural productivity. Two reports have already resulted from this effort. One, "The Expanding World Fertilizer Market," a paper by F. W. Parker, Donald Steward and Paul Peperzak delivered at the Twelfth Annual California Fertilizer Conference, Fresno, California, January 20, 1964. The other, four chapters for a United Nations Fertilizer Manual prepared by Donald Steward and Frederic Coffey which cover the following topics: "Fertilizer in Economic Perspective," "Role of Fertilizer in Agricultural Production," "Demand for Fertilizers," and "Distribution and Pricing of Fertilizers."

VIII. Country Ratings on Factors Affecting Agricultural Development

As a follow up of work done by ERS in preparation for the CENTO Rural Development Symposium held in Tehran, Iran, September 1963, AID Missions were requested to rate their respective countries with

reference to several factors considered important to their agricultural development. The ratings were to follow the pattern used by F. W. Parker and W. E. Hendrix in their paper "Foundations for Agrarian Development" presented to the CENTO Meetings. Individual country ratings for these eight factors are given in Table 3.

The ERS group responsible for the AID project also plans to rate countries. However, additional study of factors associated with development may make possible a further breakdown of the items rated by the AID Missions. The ERS ratings may, therefore, be for more specific factors rather than for those items shown in the table.

IX. Technical Advisory Committee Meeting

A second meeting of the technical advisory committee was held May 22-23 to review the progress and to advise on plans for completion of Phase A (the comparative analysis). Attention was also directed toward developing the most meaningful and effective ways to proceed with Phase B. Notes on these meetings are attached as Appendix III.

X. Productivity Seminar

AID is sponsoring a seminar under the leadership of Dr. Max F. Millikan, MIT, on problems of improving agricultural productivity in the less developed countries, June 27-August 8. ERS will use the findings from its productivity study to provide part of the framework for the seminar. The overview of the final report will be submitted, along with production indices, to provide the seminar group with empirical data upon which to base their discussions and study. Also country reports will be distributed to conference participants to provide further basis for the discussions.

TABLE 3. RATINGS* OF SPECIFIED COUNTRIES ON SELECTED ASPECTS OF THEIR ECONOMIC DEVELOPMENT FOUNDATIONS

Country	Annual compound rate of change in crop production 1/		Conditioning Factors				Production Factors			
	Total	Per capita	Land tenure	Farm prices	Markets	Consumer goods	Knowledge	Production requisites	Credit	Investments in land development
Latin America										
Argentina	1.4	-0.3	2	2	2	1	2	1	2	2
Bolivia			1	3	3	3	3	3	3	2
Brazil	4.7	1.6	3	3	3	2	3	2	2	1
Chile	2.9	0.6	3	3	3	3	3	3	3	3
Colombia	2.8	-0.1	2	3	3	2	3	3	1	3
Costa Rica	4.5	0.6	1	2	2	1	2	2	1	2
Ecuador			3	3	3	2	3	2	3	2
Guatemala			3	2	3	2	3	3	1	1
Mexico	5.7	2.6	1	1	1	2	2	1	2	2
Trinidad			2	1	3	1	2	2	1	2
Venezuela	4.9	1.5								
Africa										
Ghana			2	2	1	1	2	2	2	1
Ivory Coast			2	1	2	1	3	3	2	2
Liberia										
Nigeria	2.5	0.5	2	2	2	2	2	3	3	3
Sudan	9.4	6.6	3	3	2	3	1	3	1	1
Tanganyika	4.0	2.2	3	2	3	3	2	3	3	2
Tunisia	1.3	-0.8	1	1	1	1	1	2	1	1
Europe										
Greece	3.7	2.8	1	1	1	2	1	2	2	2
Poland	2.8	1.0								
Spain	2.4	0.6	1	3	2	2	3	2	3	2
Yugoslavia	4.5	3.4								

1/ Rates of changes are based on indices being developed in the Economic Research Service for countries included in Phase A of ERS/AID research on Factors Associated with Differences in Levels and Change in Agricultural Output and Productivity in Underdeveloped Countries. Rates of change have not been calculated for countries not included in Phase A. Rates of change are for 1948 to 1963. Note: Table continued on next page.

Continued--

TABLE 3. RATINGS* OF SPECIFIED COUNTRIES ON SELECTED ASPECTS OF THEIR ECONOMIC DEVELOPMENT FOUNDATIONS

Country	Annual compound rate of change in crop production 1/		Conditioning Factors				Production Factors			
	Total	Per capita	Land tenure	Farm prices	Markets	Consumer goods	Knowledge	Production requisites	Credit	Investments in land development
Near East and South Asia										
Egypt	2.1	-0.4	1	1	1	2	3	2	1	1
India	3.0	0.6	2	3	3	3	3	2	2	2
Indonesia			2	3	2	2	3	2	3	3
Iran	3.3	0.8								
Jordan			1	3	3	1	2	1	2	3
Pakistan	3.3	1.1	2	2	3	3	2	3	2	1
Turkey	3.9	1.0	2	2	2	2	2	3	1	3
Far East										
Japan	2.2 2/	1.2	1	1	1	1	1	1	1	1
Korea			1	1	1	2	1	2	1	1
Malaya										
Philippines	4.6	1.4	2	3	3	2	2	2	3	1
Taiwan	3.8	0.9	1	2	1	1	1	1	1	1
Thailand	4.5	1.4	1	3	2	1	3	2	2	1

2/ This is a preliminary estimate. Indices for Japan are being further examined for probable influence of recent large increases in fruit and vegetable production.

*The ratings of 1, 2, and 3 are used to mean favorable, moderately favorable and unfavorable, respectively. These ratings have been made by AID Missions for their respective countries.

Dr. Kenneth L. Bachman is serving as part of the six man steering committee for the seminar.

XI. Plans and Progress--Phase B

As reported in Appendix II of the first progress report, November 1963, at the May 6, 1963, AID/W Advisory Committee Meeting, there was considerable interest for studies to be made in Greece, Taiwan and Mexico similar to that carried out on agricultural productivity in Japan. It was later decided that work in these three countries should begin this fiscal year. Therefore, Dr. Lawrence Shaw, recruited for work in Greece, arrived there April 1 to begin work on a two-year study of factors associated with Greek agricultural development. Dr. Shaw is located at the Center of Economic Research in Athens, Greece.

Work began in late May on studying agricultural development in Taiwan at which time Dr. David Spaeth arrived for a one-year assignment in Taipei. Dr. John Brewster accompanied him to Taipei for the first five weeks to assist in the development and execution of a plan of work. In Taiwan, the study will be carried out jointly with the JCRR, which has agreed to assign the equivalent of about 1-1/4 man years to the project. It is thought that an analysis of the Taiwan experience can be completed in one year because of the large amount of data already collected and the assistance that will be provided through the JCRR.

In February, Dr. Kenneth L. Bachman traveled to Mexico to confer with Mexican and U. S. officials in Mexico relative to getting the Mexican study underway. The Mexican officials indicated

a deep interest in the project, for it would be closely related to work they wish to get started in the context of analyzing and planning investments in agriculture. Likewise, the study would build on the current supply-demand study being carried out by the Banco de Mexico under contract with ERS. It was, therefore, suggested that the proposed project be integrated with on-going research and other proposed projects to form a larger program of research, but that the ERS work would need to center on the determination of factors associated with agricultural development in Mexico and that any application to programming of Mexican agricultural development would need to be undertaken as a separate study. Mr. Wade Gregory went to Mexico the first part of June to work with Mexican officials in drawing up an outline and plan of work to insure that it meets the objective of the ERS-AID study as well as fits into the larger program of work envisioned by the Mexican government.

On April 16, 1964, a memorandum was sent to AID listing eight countries which were tentatively selected for study in Phase B, in addition to Greece, Taiwan and Mexico, with brief comments on the reasons for the selections. The countries selected were Tunisia, Nigeria, Turkey, India, Thailand, Philippines, Colombia, and Chile. These selections, of course, must be approved by AID/W and must also receive the approval of the individual country Missions. ERS plans to get studies underway in several Phase B countries during the first half of FY 1965 and the remainder in the second half of FY 1965. These studies would continue through FY 1966 and into FY 1967.

Studies will be carried out under the leadership of ERS agricultural economists located in study countries for two-year periods. Staffing will consist of one ERS man in some countries while in others ERS will locate two agricultural economists. Arrangements for cooperation with foreign government officials and research institutions will vary among countries, but in each instance, the study will be conducted in close cooperation with a local economic research institution or agency. Initial contacts are being made to probe possible arrangements by ERS personnel on their travel in connection with Phase A. ERS economists will keep in close contact with USAID Missions in developing plans and carrying out the study.

XII. Contract with Economist Development Institute, University of Nigeria

A contract has been signed with the Economist Development Institute, University of Nigeria to determine current levels and recent patterns of change in output and inputs, (total and by major output and input categories) of the agriculture of Nigeria. This project will further amplify foundation for work on Phase B if plans materialize for inclusion of Nigeria in Phase B.

The Economic Development Institute is well qualified to carry out this work. Not only is it developing a qualified staff of Nigerians but it is also supported by Michigan State University, and at the present time the Director of the Institute is filled by a member of the Michigan State University faculty.

APPENDIX I

NOTES ON THE DECEMBER 17, 1963 MEETING OF AID/W ADVISORY COMMITTEE ON THE PROJECT "FACOTRS ASSOCIATED WITH DIFFERENCES AND CHANGES IN AGRICULTURAL OUTPUT AND PRODUCTIVITY IN UNDERDEVELOPED COUNTRIES" BEING CARRIED OUT BY ECONOMIC RESEARCH SERVICE, U.S. DEPARTMENT OF AGRICULTURE

The U.S. Department of Agriculture was represented in this meeting by K.L. Bachman, R.P. Christensen, Wade Gregory and W.E. Hendrix, Economic Research Service and by A.J. Nichols, International Agricultural Development Service.

AID/W was represented by the following persons:

Frank W. Parker, HRSD/AGRIC
William Conrad, AID/RES
Alan Strout, AID/PC
Virgil C. Peterson, LA/ID/RDD
Ralph U. Battles, LA/ID/RDD
Robert L. Fowler, AID/FE/RD
Robert B. Keating, AID/HRSD/RES
Minton Peer, MR/ICD
W. S. Middaugh, AFR/ID/AG

Frederick Moore, Rand Corporation, was also present to report on related work being done by his agency.

The agenda planned in advance of the meeting was followed:

1. Comments on Semi-Annual Report: Distribution to AID Missions

The Committee expressed the view that the First Semi-Annual Report submitted by the Economic Research Service on this project was a useful report both for its review of progress made in developing this study and for the supplementary information attached as Appendices to the report. Committee members called attention to the need, however, for the questions raised on page 11 of the report to be spelled out in the form of specific hypothesis to be examined in the study. Question was also raised concerning plans to develop from farm survey data, production function estimates indicating the marginal productivity of land, labor and capital in the agriculture of the study countries. ERS personnel indicated that this would not be feasible in Phase A because of the necessity to develop this phase mainly from secondary sources of information. Other researchers, however, have attempted to develop such production functions in some of the study countries, usually for selected small areas. This information, where available, will be utilized in this study.

It was agreed that AID/W would send copies of the Semi-Annual Report to all U.S. AID Missions in countries included in Phase A.

2. Progress in Compiling and Analyzing Data for Phase A

ERS personnel reported on their progress in assembling basic background information and data for the study. Most of the information needed for the comparative analysis has been compiled for about half of the study countries. In addition, basic production statistics on most major commodities have been compiled for all countries. Basic information is also in hand for all countries on several other important aspects of the study including that on the consumption of fertilizers and pesticides, national income account items, U.S. Foreign Assistance and assistance received from international organizations annually since 1946. It is expected that production indices for all 30 countries will be completed before March 30.

3. Possible Omission of Countries in Phase A

Attention was called to the reference made in the first Advisory Committee meeting, May 7, 1963, to possibility that it might later be deisrable to drop some of the 30 countries chosen in that meeting for Phase A because of lack of data. Following discussion of this question, it was decided that for the comparative analysis called for in Phase A, use will be made of all 30 countries insofar as this can be done with available data. It was indicated, however, that for a few countries, it may not be worthwhile to make country visits and to prepare individual country reports (work papers preparatory to these visits) as called for in the Plan of Work for Phase A (Participating Agency Agreement No. 12-17-0017-132, Appendix III, page 5).

4. FAO Contract: Progress and Plans

ERS personnel reported on activities of the Food and Agriculture Organization of the United Nations under the cooperative agreement of June 18, 1963 between ERS and FAO. They indicated that the FAO has already provided ERS with copies of published documents containing information basic to developing objectives of the study, such as information on fertilizer uses, agricultural education, extension and research, credit, and marketing. They have provided tabulation sheets of listings of important statistical information from FAO records for the 30 countries. Additional information will be sent to ERS as it is compiled. This agreement calls for aninterim report to be submitted by FAO to ERS covering FAO activities on this study through December 31, 1963. This report will include information compiled by FAO to December 31.

5. Foreign Travel Plans: Phase A countries

ERS personnel indicated plans to begin in March 1964 to visit several of the Phase A study countries. This travel will be done as a means of checking data compilations and preliminary

Following presentation of this paper, CENTO country delegations made comparable ratings for their countries. This appeared to be an effective way of getting these delegations to examine the agricultural progress being made in their respective countries with a view to indicating the places where they need to strengthen their efforts.

It was suggested that such ratings by AID Missions and even by the Ministry of Agriculture in the countries where there are AID Missions, would serve similiarly valuable purposes in policy and program evaluation. At the same time, such ratings by AID Missions and Ministries of Agriculture might provide leaders in the ERS Productivity Study information of much value in explaining why certain approaches to agricultural development have been emphasized and other given little attention in the study countries.

For these reasons, it was proposed in this meeting that copies of the paper "Foundations for Agrarian Development" together with a set of guides for rating countries be sent to each AID Mission with the request that it provide AID/W its own rating of its host country with respect to certain factors basic to agricultural development and where feasible that the AID Mission also have ratings made by the Ministry of Agriculture in these countries. It was also agreed that ERS and AID/W would prepare independent ratings of the countries participating in Phase A of the project.

10. Planning for Phase B Studies

Attention was called to the need at an early date to program operations for Phase B studies. The need to take account of these studies in Budget requests that have to be finalized early in 1964 make it necessary that countries in which Phase B studies are to begin in Fiscal Year 1965 be selected soon. Since it is expected that AID Missions in the countries selected will help to finance this study and since it is considered important to have the host government also actively involved in these studies, it is important that investigations and negotiations aimed at consummating the necessary cooperative agreements between ERS, AID/W, AID Missions and host governments be initiated early. In deciding on the countries to be selected, careful consideration will be given to the AID Mission replies to AID to Circular 1099 "How do Countries Increase Agricultural Production," which replies are summarized in Appendix III of the First Semi-Annual Report. Within these limitations, strategic importance of countries in the economy of the larger region in which they are located, the extent of their recent agricultural progress, how well they qualify as laboratories for the study of particular kinds of problems--these are some of the factors that will be weighed in choice of countries. ERS and AID/W will endeavor to select countries for Phase B studies by March 31, 1964.

APPENDIX II

Notes on Meeting of AID/W Advisory Committee on the Project, "Factors Associated with Differences and Changes in Agricultural Output and Productivity in Underdeveloped Countries," being Carried Out by the Economic Research Service, U.S.D.A.

The following notes were prepared on the second meeting of the Advisory Committee held June 10, 1964, at the State Department. The Advisory Committee was organized as provided on page 2 of the Participating Agency Agreement to provide coordination with other AID research and operations.

ERS was represented by the following:

Sherman Johnson, ERS
Kenneth L. Bachman, ERS/DTA
W. Elbert Hendrix, ERS/DTA
Clarence A. Moore, ERS/DTA
Harold T. Yee, ERS/DTA
Quentin W. West, ERS/FRAD
James J. Naive, ERS/FRAD
Matthew Drosdoff, IADS

AID was represented by the following:

Gilbert Brown, FE/PL
L. S. Christey, AFE/AG
David C. Cole, AA/PC
Arthur H. Darken, TER/ORA
Thomas W. Hazard, LA/ID
Ronald Jones, TCR/AID
Erven Long, AID/Agriculture
Monroe McCown, NESA/ID
Talif Miller, LA/ID/RND
Harry Naylor, ORA/AID
C. L. Orrben, FE/Tech
Frank W. Parker, AID/Agriculture
Virgil Peterson, LA/ID/RND
S. C. Salmon, AID/Agriculture
Alan Strout, AA/PC
W. H. Wriggins, PPC/State

I. Introduction:

The objective of the meeting, as stated by the chairman, Dr. Frank Parker, was to provide an opportunity for AID to advise and offer suggestions to ERS on the contracted study. The chairman gave a short resume of the record to date and made references to the First and Second Progress Reports, papers prepared for the MIT Meeting, and plans for the study in FY 1965.

The comparative analysis report is due this Fall, and special studies are currently being conducted in Greece and Taiwan with discussions underway with Mexico for a similar study.

II. Research Progress on Phase A:

A. Crop Production Indices:

Q. West reported on the state of the construction of production indices. The product coverage and quality of data used in the indices varied among countries. Some indices include such disaggregated information as crop, livestock, export products, domestic products, etc. The attempt to include livestock products presented particular difficulty in the countries under study. In many cases livestock data are either not available or of such questionable quality as to preclude their inclusion in the indices.

The indices are constructed using the Modified Laspeyres Formula with 1957-59 price weights and a 1957-59 base. The time series covered the period from 1948-1963 for most countries.

It was stated that AID depends on the USDA for production indices in their planning activities and the question was asked whether the methodology used for this study was being adopted in the construction of indices for countries not included in this study. The answer was negative, present plans do not call for revision to subject all countries to the same methodology. The index series constructed for this study will be continued using the revised methodology. The crop indices are presented in Table 1 following page 3 of the "Second Progress Report."

The problem of food production was discussed. West felt that with the exclusion of Red China world food production has just about kept up with population growth. With the inclusion of Red China, however, food production has lagged behind population growth.

Changes in prices over time, a reflection of structural changes, is an important determinant of productivity. Prices, of course, would not be directly calculated in the usual definition of productivity, but will act as a determinant on resource combination and thus influence the input-output ratio only indirectly. This does not, however, negate the importance of price changes and this question deserves our consideration.

Table 2 of the "Second Progress Report" was then discussed. As an indication of agricultural progress, annual growth rates in total crop production were used. Any single variable criterion as a measure of economic progress is subject to obvious weaknesses. The need for a multi-dimensional criteria set to measure economic growth was emphasized. In particular, the absolute level of consumption must be considered in conjunction with its rate of improvement.

B. Country Visits:

Twenty of the thirty countries included for Phase A study were visited by members of the ERS research team. The objectives of the visits were: (1) To supplement through personal visit the secondary sources of information available in Washington, D.C. (2) to look for relevant qualitative facets of the development problem, and (3) to explore the potentials for a Phase B study in the respective countries.

C. Country Reports:

Country Reports prepared for the MIT Conference are the following: Greece, Nigeria, Egypt, Argentina, Philippines, and the United States. Countries covered in reports of less detailed nature are Mexico, Liberia, Sudan, Yugoslavia, Spain and Turkey.

It was emphasized that country reports should not be pushed in substitute for the more fundamental product, the comparative analysis. The proper time for detailed country studies is in Phase B as planned under the AID-ERS Contract.

D. Country Ratings:

Countries were rated by AID Missions in the respective countries with respect to conditioning factors and production factors. Conditioning factors include land tenure, farm prices, markets, and consumer goods. Production factors include knowledge, production requisites, credit, and investments in land development. The scale of ratings were 1, 2, and 3 according to whether the factors were favorable, moderately favorable, and unfavorable respectively. The results are presented in Table 3 of the "Second Progress Report."

The ratings were requested by AID-Washington from AID missions to stimulate thought and discussion on a range of variables, as opposed to a single variable, that seem to be important in development planning. Admittedly the ratings were scored by different individuals and there is a question of comparability and consistency. Nonetheless, it was felt that worthwhile hypotheses may be obtained from a study of the ratings and a correlation may exist between the successful countries--as defined by some measure of levels of output, and rates of change in output and productivity--and the ratings. Even if working hypotheses are not definable, suggestions may be obtained as to other factors for inclusion, variables requiring disaggregation etc.

It was emphasized that the factors included in the ratings contain a cultural bias. These factors assumed to be important for development were suggested by good-intentioned people of U.S. orientation and when these factors are subjected to a different set of institutions the hypothesized relationships may not be valid. A case in point is land tenure in Nigeria. Land is of tribal ownership and the rights of private ownership as envisioned in our society have no counterpart in Nigerian society.

E. Outline for Phase A Report

The outline for the Phase A report is organized into 16 separate chapters, see appendix. With the exclusion of the introductory and summary chapters, each chapter covers a particular phase of the development problem. The chapters taken by themselves may seem to be disjointed and their relationships to each other may not be obvious. A closer look, however, will reveal that chapters III to XI deal with problems on the supply side, chapters XII to XIV deal with problems of demand and marketing, and chapter XV deals with the inter-relationships between supply and demand. In this last subject chapter, XV, the factors covered in each of the above mentioned separate chapters will be integrated into a single system, each part connected and interdependent, and the development problem will be studied within the context of the inter-relationships among the various components of supply and demand. In the jargon of the economists, this type of framework follows that of a general equilibrium model.

In an organizing framework such as this, data needed to fill the specified requirements of the outline may not be available and there is a real need to guard against being captives of the structure.

There will be a need for a careful definition of what constitutes progress in a country. What are the appropriate measures of progress? Will there be a need to consider the intertemporal measurements of progress, e.g., the relationship between lags in observable output and fixed investments?

There will also be a need to consider for some countries periods before World War II. Some countries had rapid progress in their agricultural sectors in the past and rapid growth in agricultural output is not to be expected in the period selected for analysis, 1948-62.

As a final point, water as a resource was suggested for separate treatment rather than being included under land because of its importance in many of the developing areas.

III. Special Country Studies

As Phase A work progressed, AID/W and USDA/ERS felt that fruitful insights may be obtained from an early detailed study of selected countries that have had recent impressive records of agricultural development. The results from these studies may provide hypotheses for consideration in the Phase B work as well as supply AID with possible guidelines required in their programming activities. Of the "economically emerging nations" Greece, Mexico, and Taiwan seem to indicate the best alternatives for the pre-Phase B studies. At the moment Dr. Lawrence Shaw has begun work on Greece, in cooperation with the Center of Economic Research in Athens. Dr. David Spaeth, in cooperation with the Chinese-American Joint Commission on Rural Reconstruction, will study the development problem in Taiwan. Wade Gregory is in Mexico conferring with Mexican officials for the last of the special studies.

IV. Plans for Phase "B"

Phase B studies were to be conducted in those countries where local AID missions would help in the financing. But in view of the lateness of AID-Washington's requests, Phase B studies will be conducted where local missions have indicated an interest and the initial financing will be assumed by AID-Washington with the local missions assuming the financial responsibilities in FY 1966.

AID/W and USDA/ERS have examined USAID replies to refairs and considered reports of ERS staff visits to countries, availability of dates and research institutions and other factors that relate to the selection of countries and Phase B studies. The following eight countries, two in each AID region, have been provisionally selected as the first choice for such studies.

Philippines	Tunisia
Thailand	Nigeria
India	Columbia
Turkey	Chile

It seems desirable to start Phase B studies in only four countries in FY 1965 and possibly additional countries in FY 1966. The target date for stationing an agricultural economist in the countries is January, 1965.

Some local countries have indicated a lack of funds for counter-part participation. However, the commitment of financial support from host countries may be a prerequisite for their wholehearted cooperation in the Phase B studies. This problem will require further attention.

The possibility of alternative countries for study as a solution to the problem of noncooperating countries or those with insufficient funds for close cooperation was raised. This question will be explored further by the principal contractors.

APPENDIX III

MINUTES OF THE SECOND MEETING OF THE TECHNICAL ADVISORY COMMITTEE OF THE AID PRODUCTIVITY STUDY - MAY 22, 1964.

The Technical Advisory Committee on the AID Productivity Project held its second meeting on May 22, 1964. Dr. Sherman Johnson served as chairman for the meeting.

Committee members present were:

Dr. Sherwood O. Berg, Dean
Institute of Agriculture, University of Minnesota, St. Paul, Minn.

Professor Max Millikan, Director, Economic Development Center
Massachusetts Institute of Technology, Cambridge, Massachusetts.

hn H. Provinse (retired) formerly Associate in Community
pment, Council on Economic & Cultural Affairs, Inc., New York.

Dr. Gustav Ranis, Associate Director, Economic Growth Center
Yale University, New Haven, Connecticut.

Dr. Kenneth L. Turk, Director, International Agricultural
Development, Cornell University, Ithaca, New York.

Other participants were:

Sherman Johnson, Deputy Director for Foreign Economics, ERS-USDA (Chairman)

Frank Parker, Deputy Director, Agriculture Service, Technical Cooperation and Research, AID

Raymond Christensen, Deputy Director, DTA, ERS-USDA

Wade Gregory, Chief, Economic Development Branch, DTA, ERS-USDA

Elbert Hendrix, ERS-DTA

Quentin West, Deputy Director, Regional Analysis Division, ERS-USDA

Charles A. Gibbons, RAD-ERS, USDA

Gerald E. Tichenor, Deputy Administrator, International Agricultural Development Service, USDA

Nathan Koffsky, Administrator, ERS-USDA

Matthew Drosdoff, Administrator, IADS-USDA

Clarence Moore, ERS-DTA

Donald Steward, ERS-DTA

Dwight Gadsby, ERS-DTA

Harold Yee, ERS-DTA

Steven Breth, ERS-DTA

Chairman Johnson opened the meeting at 9:30 a.m. by introducing committee members and other participants present. Regret was expressed that two committee members, Dr. William W. Lockwood and Dr. E. T. York were unable to attend the meeting. Attention was then devoted to (1) Research progress in Phase A of the study, and (2) Plans for development of Phase B.

Discussion was first directed to Dr. Christensen's paper, "Mechanics of Agricultural Productivity and Economic Growth" to be published in Agricultural Economics Research, USDA, July 1964. Dr. Christensen commented that this paper was developed with the intent of providing a model that might be useful in Phase A of the productivity project in measuring agricultural productivity and its role in economic development.

In the discussion which followed, several points were made relative to the model as

(1) The model assumes a net transfer from agriculture to other segments of the economy. In further development of the model, attention might be focused on the role of industry as it contributes to agricultural development as well as agriculture's contribution to industrial development and alternative assumptions.

(2) The final model developed should include such aspects as price relationships and the influence of price changes on agricultural development.

(3) While the model has much merit, there will be need to go behind the model to some of the questions of why the developments occurred including incentives, motivations, stage of technology, etc.

The general consensus was that the model might first be tested in a few countries. As a result of such testing, revisions and refinements might be made as necessary to facilitate the use of the model. Consideration should then be given to more extensive use of the model during both Phase A and Phase B of the study.

Comparative Analysis

In reviewing the outline, the committee discussed the following points:

Human Factor. Analysis of sociological, anthropological, political and cultural considerations should contribute materially to explanations of the rate and direction of economic development. Such factors at least partially set the framework within which economic development can proceed. Included are: Political stability and administrative capacity of government, the degree of leadership developed at all levels -- central government to the village, level of developed technology, the people's innovativeness and readiness to accept change, and other incentive and motivational factors -- both of an economic and a non-economic nature.

Treatment of values, philosophy, and motivation is included in the present outline only as it is touched upon within any one or all of the respective chapters. A general feeling was expressed that a more direct and explicit treatment of such social factors was desirable.

After considerable discussion of the importance of the human element in economic development, the committee concluded that the scope of the present study would not permit either a highly qualitative or quantitative analyses in Phase A of the sociological, cultural and political factors. The suggestion was made, however, that a brief but specific treatment be included in the report of these considerations, recognizing their importance, itemizing the various features, and describing their characteristics.

Marketing and Prices. Suggestions were made that in the prices and marketing analysis, attention should be directed not only at agricultural prices but also at (1) relationships of producer prices to export prices, (2) the country's position relative to international trade, (3) the influence of rising prices on increasing output and marketings, (4) the movement of the general price level, the amount of inflation and their effects on agricultural production, and (5) the availability to the rural segment of desired low-cost commodities as a motivating factor for increasing agricultural production.

Risk and Uncertainty. The Committee suggested that efforts should be made to analyze the effects of risk and uncertainty on production. While price uncertainties would be touched upon in the marketing section, the need was expressed for looking more specifically at risk and uncertainty relating to phenomena other than price. Consideration should also be given to the risk-bearing position of the indigenous farmer.

Country Ratings. With reference to country ratings as given in Table 3 of the Second Progress Report of the AID Productivity Study, the committee was informed that in spite of the apparent limitations such ratings would serve as proximate measures for comparative purposes and their use could be expected (1) to stimulate analysis by AID missions

and indigenous personnel as to the various factors of development, and (2) to stimulate further research in these areas.

Production Indices. Brief discussion of the production indices prepared by the Regional Analysis Division, ERS, centered on the limitations of statistical data--both quantitatively and qualitatively--from which these indices were computed. Mr. Gibbons stated that the indices are restricted to crop production inasmuch as livestock is relatively unimportant in the commercial agriculture of many countries and livestock statistics are generally of limited usefulness. The committee suggested, however, that consideration be given to combining livestock and crops in the preparation of production indices in those countries where livestock is relatively important and acceptable livestock statistics are available. Comparison might then be made among countries such as Mexico, Argentina, Poland, Yugoslavia, and Japan where livestock plays a more prominent role. In turn,these countries could be compared with other countries, such as those of Africa, where livestock is relatively unimportant and production is measured solely in terms of crops.

Country Reports. Some individual staff members have devoted considerable time to overall analyses of individual countries. Preliminary reports of these analyses are nearing completion and will be used as work papers in the MIT conference. Work on the country studies has provided a background for development of the comparative-analysis outline and provides a basis for orienting the work in Phase B.

Emphasis has now been shifted to making a comparative analysis of 25 to 30 countries. In the conduct of this work, individual staff members are shifting from a broad overall approach of an individual country to a many-country consideration of selected aspects.

The suggestion was made that time limitations place the greater priority on the comparative analysis. It was also suggested that as the real "payoff" of the project might lie in the Phase B work. Time devoted to the comparative analysis might be restricted as much as possible with Phase B receiving the priority of attention.

Dr. Parker remarked that while the Phase A effort should concentrate on the comparative analysis, the preliminary country reports should be sent to respective country missions for their review and comments. He further stated that while he would look forward to receiving a draft of the comparative analysis report by October 1964, he felt this work was sufficiently important that, if necessary, an additional month or more be allotted for its completion.

Development of Phase B

Intensive study of selected countries in Phase B will have three major objectives:

(1) To determine and explain the past progress in agricultural development, including interactions between agricultural and nonagricultural sectors;

(2) To determine the implications for other countries in the area, and

(3) To arrive at implications for future policy actions.

Several suggestions were made relative to the approach that might be taken in Phase B.

(1) While the orientation will doubtless vary from country to country, work in the first year of Phase B might concentrate essentially on the more

aggregative, macro analysis, building upon the work done in Phase A. In the second year, emphasis might shift more to micro level of analysis - farmer surveys, gathering of price data, cost and returns analysis, etc.

(2) While there may be a need for conducting numerous micro studies, care must be taken in restricting the number and scope of such studies to avoid spreading of available staff time too thinly.

(3) Fullest possible use should be made of existing research groups within the Phase B countries and of available research results.

(4) Human and institutional factors are important. While it might be a mistake and a diversion of resources to attempt a thorough analysis of these factors in Phase A, they should be studied more intensively and adequately in Phase B.

(5) At some point in the study, consideration might be given to moving more toward an interdisciplinary approach, perhaps associating sociologists and persons from other disciplines with the conduct of the research on a consulting basis.

(6) Phase B should yield two products: Comprehensive country reports and a comparative analysis of the 8 to 10 Phase B countries. The limited staff based in Washington should be responsible for the latter.

(7) Emphasis must be placed on the continual and more rigorous development of testable hypotheses throughout both Phases A and B of the study.

(8) Quantification of phenomena should be stressed, even at the risk of using data of questionable accuracy. Care should be taken, however, to qualify these quantitative measures where necessary and to allow for sensitivity and the impact of possible error on conclusions.

Plans for Future Committee Action. A concerted effort will be made by the ERS staff to draft a report of the comparative analysis for circulation to committee members in October. Tentative plans were therefore made for holding the third meeting of the Advisory Committee in early November, 1964. Primary attention would be given to a critical review of the preliminary draft so that the ERS group could incorporate the Committee's comments and suggestions into the final draft of the comparative study.

Prior to adjournment, the Committee expressed satisfaction with the progress made in the study since the previous advisory committee meeting.

Preliminary Draft of Outline for Report
on
INCREASING AGRICULTURAL OUTPUT AND PRODUCTIVITY
IN UNDERDEVELOPED COUNTRIES*

I. Agriculture in National Economic Development

A. How increases in agricultural production contribute to general economic growth.
B. Extent of agricultural "surplus" in rapid and slow growth countries.
C. Resource transfers among sectors.
D. Nature of agriculture's contribution at different stages of development.

II. General Overview--Problem of Study and Major Findings

A. Objectives, scope and method of study.
B. Need for increasing agricultural output and productivity.
C. Countries used as factural basis of study; description of major land and location features, level of development, agricultural characteristics, dualism, etc.
D. Inter-country comparisons.

1. Levels of agricultural output and productivity.
2. Rates of change in agricultural output and productivity.
3. Factors associated with differences in levels of production.
4. Factors associated with differences in rates of change in agricultural output.
5. Implications for subsequent parts of study.

SUPPLY ASPECTS OF PROBLEM

III. Sources of Differences and Changes in Agricultural Output

A. Commodity basis of output and of changes in output-including attention to trends in production of tropical and food crops.
B. Resource and technological basis of present levels and recent changes in output.

1. Changes in land area.
2. Changes in output per unit of land.

a. Associated with changes in irrigation.
b. Associated with changes in enterprises affecting intensity of land use (other than irrigation).
c. Associated with yield increases.

(1) Fertilizer uses.
(2) Other techniques.

*Report on Phase A of ERS/AID project on Factors Associated with Differences and Changes in Agricultural Production in Underdeveloped Countries. This report will distinguish wherever possible between export, domestic, commercial and subsistence sectors of agriculture, also between tropical and temperate zone agriculture.

IV. Land and Other Natural Features in Agricultural Development

A. Possible ways in which land and related natural features influence agriculture.
B. Influence of differences in land characteristics.
C. Influence of differences in amounts of land relative to labor and capital resources.
D. Possibilities of substituting labor and capital for land.
E. Land development, costs, policies and programs.
F. Rating of countries with reference to land features.

V. Land Tenure and Size of Farms and Their Relations to Agricultural Output and Development

A. Relation of tenure to output and progress.

1. Ways in which tenure affects output and development.
2. Tenure patterns in underdeveloped areas examined from point of view of factors identified in (1) as logically related to output and progress.
3. Land tenure policies and programs.
4. Ratings of countries in tenure features.

B. Relation of size of farms to output and progress.

1. Economies of scale.
2. Relevance to technological possibilities.

VI. The Human Factor in Agricultural Output and Development

A. Quantitative considerations.

1. Numbers of people relative to land and labor resources.
2. Population growth rates and their bearing on resource combinations, uses, and output.
3. Nonfarm employment opportunities (including international labor movements).
4. Wage and employment policies.

B. Qualitative considerations.

1. The "effective" supply of major classes (such as unskilled, entrepreneur, etc.) of the human factor as a function of value and cultural orientations.
2. The "effective" supply of major classes of the human factor as a function of factors affecting employment capacities, such as age and sex distribution, health conditions, educational levels, skills and experience backgrounds.

C. Policies and programs for development of the human factor.

1. Health and sanitation measures.

a. Kinds and extent of programs.
b. Ratings of countries on health conditions.

2. Education.

a. General education.
b. Agricultural education.
c. Agricultural extension.
d. Rating of countries on each of (a), (b), and (c) items.

VII. Capital and Credit in Agricultural Output and Development

A. Conceptual frame of analysis.
B. Present capital features-forms or uses, amounts, distribution between export and domestic sectors, and their relations to output levels.

1. Farm capital.

a. Fixed.
b. Variable.

2. Agricultural overhead capital.

a. For provision of production requisites.
b. For marketing and processing of products.

3. General overhead capital.
4. Rating of countries in regard to above capital features.

C. Additional capital requirements.
D. Capital mobilization.

1. Possible sources of supply of additional capital.

a. Foreign grants, loans, and investments.
b. Transfers from other internal uses.
c. Internal savings, including saving in kind achieved mainly through labor inputs; also voluntary and forced savings.

2. Conditions affecting capital mobilization.

a. Marginal efficiency of capital-as affected, for example, by technological possibilities and market conditions.
b. Institutional factors.

E. Agricultural Credit.

1. Roll of credit in agricultural production and development.
2. Existing credit facilities.

a. Sources of credit.
b. Size of loans and volume of credit activities.
c. Loan purposes.
d. Interest rates and other terms of credit.
e. Rating of countries in regard to credit facilities and practices.

3. Policies and programs for improving credit facilities.

VIII. Technology

A. Technology currently in use.
B. Known "improved" technology adaptable to underdeveloped countries.

1. From their own "best" farms.
2. From other countries.
3. From their own researches.

C. Complementarity of technologies.
D. Problems and progress of underdeveloped countries in incorporating improved technology into their agriculture.
E. Research in underdeveloped countries to adapt and improve technology.

1. Present status of research.
2. Beginnings and history of research in underdeveloped countries.

F. Evaluation and country ratings in reference to technology currently in use, known technology adapted to countries, and status of agricultural research institutions.
G. Fertilizers as a special case study.

1. Input and output price ratios in major countries.

IX. Nature of Supply of Major Production Requisites

A. Sources of supply.
B. Adequacy and dependability of supplies.
C. Prices.
D. Distribution facilities and problems.
E. Policies and programs affecting availability of production requisites to farmers.

X. Economic Organizations, Administrative Facilities and Their Relations to Agricultural Development

A. Relative roles of national, provincial and local leadership and of public and private sectors.

B. Structure, powers, representation and stability of governments and governmental agencies.
C. Organization and administration of public agricultural agencies.
D. Structure and developmental roles of major nongovernmental agencies, including familistic groups and individuals.
E. Ratings of countries on above features.

XI. Summary of Supply Aspects of Problem-Attention will be given to competitive position of underdeveloped relative to developed countries and to the role of governments in altering supply conditions.

DEMAND, PRICE AND MARKETING ASPECTS OF PROBLEM

XII. Demand and Market Bases of Agricultural Production in Underdeveloped Countries

A. Major sources of demand.

1. "Reservation" demand.
2. Domestic nonfarm demand.

a. Food.
b. Industrial.

3. Foreign demand.

B. The recent and current demand situation in domestic and foreign markets for major agricultural products grown in underdeveloped countries and factors underlying recent demand shifts and prospects (with attention to differences for temperate zone and tropical products).
C. Relations of demand conditions to performance of the agricultural sectors
D. Rating of countries in strength of demand for increases in their agricultural production.

XIII. Prices and Price Policies.

A. Current prices at farm levels--international comparisons including comparisons with advanced agricultural countries.
B. Price stability.
C. Policies affecting prices received by farmers including trade agreements.
D. Rating of countries in regard to level and stability of prices received by farmers.

XIV. Marketing Facilities and Practices

A. General considerations.
B. Present marketing facilities and practices.

In this part, attention will be given to physical facilities for collection, transport, and processing of farm products from local to central market levels; to kind of buyers and their linkage to land owners and suppliers of credit; to wastages of products; and to marketing costs.

C. Policies and programs for improving marketing methods.
D. Rating of countries with reference to adequacy of their marketing facilities.

SUPPLY-DEMAND INTER-RELATIONS

XV. Supply-Demand Inter-Relations

Any interactions between supply and demand conditions which themselves affect supply and demand levels have to be explained by reference to the structural interdependence between farm and nonfarm sectors of the economy. The relations between these sectors are such that agriculture depends upon nonfarm sectors as markets for its production and as sources of supply of the production factors and of the consumer goods and services that agriculture does not itself produce, whereas the nonfarm sector depends upon agriculture for markets for its output, for foods and fibers, and may draw upon agriculture for labor and savings for nonfarm employment and development.

In this phase, we will examine the interactions between supply and demand elements associated with actual or postulated changes in agricultural production. In this analysis, we will use a multi-sector analytical model distinguishing between the foreign trade, nonfarm domestic, commercial farm and subsistence farm sectors, and will use major findings developed in preceding parts of this study (concerning resources, production functions, market structures, elasticites of supply and demand, propensities to save, etc.) as parameters of our problem. Since at best, many of the "boxes" in our general equilibrium or "input-output" model will be "empty" or filled with only general qualitative statements, we probably will be much more successful in this analysis in indicating general nature and direction or shape of relationships then in indicating their precise values.

SUMMARY AND CONCLUSIONS

XVI. Summary of Major Findings and Their Implications for Policies and Programs, Including Further Research