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THE AGRICULTURAL ECONOMICS PROGRAM
OF
CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL
CIAT

Program description and
plans as of May 1, 1972



25609

CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL

Apartado Aéreo 6713

Cali, Colombia

FOREWORD

The present report outlines policy guidelines with respect to research, training and research consulting activities of the Program of Agricultural Economics of Centro Internacional de Agricultura Tropical (CIAT).

While the economics activities are included as integrated parts of the various multidisciplinary commodity reports in the annual reports of CIAT, it was felt to be advantageous to review the economics activities as a whole. This discussion attempts to set the stage with respect to program policy. Future reports concerned with major research findings and future research and training priorities will be issued once a year, the first one being planned for January, 1973.

Acknowledgment is due to a number of persons both within and outside CIAT for valuable suggestions and comments to earlier drafts of this report.

Comments and suggestions concerning improvement of our program are solicited.

Per Finstrup-Andersen
Leader, Program of
Agricultural Economics

Cali, Colombia, May 1, 1972

Centro Internacional de Agricultura Tropical (CIAT) is an international agricultural research and training institution established to help accelerate agricultural development and improve levels of living in the lowland tropics. It is a non-profit organization with financial support from a number of sources, including private foundations, international banks and national aid agencies. It is governed by a Board of Trustees.

Started in 1968 and located near Cali, Colombia, CIAT focuses its activities on improving production technology of the lowland tropics through multi-disciplinary, problem-solving research.

Presently, CIAT concentrates its efforts and resources on six agricultural products for lowland farming systems: beef cattle, cassava, swine, rice, maize and field beans as well as multi-commodity agricultural systems. Beef cattle and cassava are the two major commodity thrusts.

Efforts to accelerate economic growth in the lowland tropics must be based on changes in technical, social and economic factors involved in production, distribution and consumption systems.

Economical improvement in the quantity and quality of food production and achievement of higher levels of living require technological changes but improved techniques of production alone are insufficient. Appropriate incentives, reduced uncertainty and a clear understanding of economically sound decision-making are also required.

Because optimum allocation of available resources among alternative production possibilities is determined by economic, social and

cultural, as well as technical relationships, economists are members of CIAT's multidisciplinary teams. Special emphasis is given to the impact of alternative technical and policy changes on general economic progress and welfare of people.

The objectives of the Agricultural Economics program are (1) to help identify factors limiting the production of the commodities included in the CIAT program in the lowland tropics and (2) to assess the economic and social implications of alternative ways of eliminating, or reducing them for the purpose of (a) helping guide the allocation of research and training resources within CIAT and collaborating agencies and (b) assessing the probable consequences of alternative private investment and public policies with respect to food, agriculture and human welfare in the lowland tropics.

The means utilized to fulfill the objective include research, training and research consulting services.

RESEARCH

Allocation of Program Research Resources

General Research Priorities

At this early stage of CIAT development, basic information on (1) technical and socio-economic aspects of the production practices presently encountered in the lowland tropics of Latin America, and (2) certain market relationships and macro economic implications of expanded production are urgently needed to help guide the development of the CIAT commodity programs.

Hence the general priority areas of research at present ^{1/}, are aimed at:

1. Identifying the major bottlenecks in production and marketing of the products included in the CIAT overall program; estimating the relative economic importance of each one of these bottlenecks and estimating the cost of reducing or eliminating them. This area of research would include research to assess the major socio-economic barriers to the adoption of new agricultural technology.

2. Introducing the economic dimension into the biological, technical and social sciences research programs and projects of CIAT and collaborating agencies to the extent that such introduction can be expected to improve the efficiency and relevancy of the research efforts.

3. Analyzing certain aspects of the present and future demand structure for the products. Both direct and derived demands will be considered. Research to identify economically sound non-traditional utilization of products with low direct price elasticities of demand will be emphasized. Possibilities of import substitution and expanded exports will be analyzed. Certain products not included in the overall CIAT program will be analyzed from the point of view of resource competition and product substitution.

4. Assessing certain socio-economic consequences of the adoption of new agricultural technology. Attempts will be made to predict changes in such key variables as product price, production, farm returns, factor

^{1/} The research program performance and priorities will be assessed periodically to attempt relevancy and efficiency.

returns, nutrition, distribution of incomes, employment, and changes in external trade which would result from changes in technology brought about through research and technical assistance carried out by CIAT and similar entities. Initially, emphasis will be placed on estimating the distribution of benefits from the adoption and use of improved technology among the various sectors of the economy. The importance of improved agricultural technology as a promoter of economic development will be analyzed at some later stage. Attempts will be made to estimate the relative contribution to economic development of various private and public strategies of developing and introducing improved technology.

Given the broad scope of the priority areas for research expressed above and the limited resources of the agricultural economics program, a great deal of the work will have to be carried out by collaborating agencies and/or researchers. Thus, initially the program staff will concentrate on priority areas one and two and certain aspects of areas three and four as expressed below by commodity. Extensive projects which involve little or no multidisciplinary research such as traditional demand studies will be encouraged as special projects by collaborating agencies. These aspects will be further discussed in a latter section of this report.

Allocation among and within commodities

Research needs tend to vary among products according to commodity characteristics, level of technology and stage of biological, technical and economic research. Present high priority areas of research by commodity are given below.

Beef Cattle. In addition to a direct participation in ongoing animal science projects, a description and analysis of existing beef cattle production and marketing systems in the lowland tropics of Latin America will be continued. While this work is presently being carried out in Colombia, similar projects in other countries will be promoted through national agencies. This work is expected to provide basic information on factors limiting beef production and productivity and their economic importance.

The impact of production expansions on employment, income distribution, foreign exchange earnings and human nutrition will be analyzed. Possibilities of demand substitution between beef and pork will be analyzed considering price relationships, consumer preferences and macro economic implications. Attempts will be made to initiate research in collaboration with the international lending agencies on the impact of credit on production and productivity.

Cassava. The work in this field presently focuses on describing and analyzing existing cassava production and marketing systems to identify possible economically efficient ways to expand production and improve productivity of cassava.

A comprehensive analysis of the market prospects for cassava is being planned in collaboration with University of Guelph and the International Development Research Centre of Canada.

Research on economic losses during transportation and storage will be initiated, as well as research to analyze the implications of expanded production on employment, farm returns, income distribution and foreign trade.

Swine. The work is presently focused on two aspects of swine production in the lowland tropics:

1. Economic evaluation of available swine feeds. The analyses are based on nutritional data presently available from the Swine Production program.

2. Describing and analyzing the existing production and marketing systems in the lowland tropics of Latin America.

The work includes analyses of selected aspects of swine production such as economies of size of producing units, and collaboration with Production and Animal Health programs in pilot studies aimed at developing improved production systems for small farms.

Rice. The research is focused on the socioeconomic implications of the adoption of the new varieties under various public policies. Attempts will be made to estimate the impact on employment, resource earnings, net farm revenues, consumer outlay and risk. Adoption patterns will be analyzed in collaboration with the Communication program. The market prospects for rice is being analyzed with emphasis on identifying economically sound alternative ways of utilizing increasing quantities of rice.

Maize. Major emphasis is placed on two issues: (1) the economic feasibility of producing Opaque-2 maize for human and animal consumption and (2) ways of increasing maize yields and reducing costs of production among small farmers in Latin America. The latter issue includes plans to identify major factors limiting production of maize in the Andean Zone and to estimate their economic importance.

Beans. The activities in this field will focus on obtaining information on the economic importance of field beans and other selected food legumes in Latin America and estimating expected social payoff from research aimed at expanding their production to help CIAT determine its future research efforts in beans.

Attempts will be made to initiate work in the following two areas:

1. Present and expected future demand structure for field beans and other selected food legumes in Latin America and possibilities for export to countries outside the region.

2. Factors associated with low yields of field beans and other selected food legumes in Latin America, their relative economic importance and the approximate cost of removing these factors.

Multi-product agricultural production systems. An economic analysis of certain existing production systems for small farmers in the lowland tropics of Latin America is planned. On the basis of the information obtained, attempts will be made to develop improved systems acceptable to the small farmers in the regions under consideration. The relative risk and uncertainty of the various systems will be estimated along with relative expected net returns, cash flows over time and impact on the nutritional situation of the farm family.

Cross-commodity studies. While most research projects are carried out on a specific commodity in close collaboration with scientists from other disciplines, certain projects are most efficiently carried out on a number of commodities simultaneously. Although these projects are directly related to the commodities included in the overall CIAT program,

they do not logically fall under any one of these.

Research is in progress to estimate the potential impact on consumer welfare of expanded production of a number of basic foods. Another cross-commodity study in progress attempts to estimate the economic feasibility of utilizing rice, maize and cassava for partial substitution of wheat imports in Latin America and the socioeconomic implications of such import substitution. Research will be initiated to improve presently available models for the allocation of research resources in agricultural research with primary emphasis on developing a framework for efficient allocation of resources within CIAT and collaborating agencies.

Allocation of professional and financial resources

Based on the above research priorities, professional and financial resources during 1972 and 1973 are planned to be allocated as shown in Table 1.

The budget will be allocated in proportion to the personnel allocation.

Project selection

Given the broad spectrum of the research to be carried out and the limited research resources available, project selection must be based on a set of well defined criteria to assure efficient allocation of available research resources. Based upon present criteria a project should:

1. Be consistent with the overall program objectives and research priorities outlined above.
2. Be oriented toward solving a specific problem which is thought

TABLE 1. ALLOCATION OF PROGRAM PERSONNEL1972 AND 1973

<u>Commodity</u> ^{1/}	<u>Man-years</u> ^{2/}			
	<u>1972</u>		<u>1973</u>	
<u>Primary emphasis:</u>	<u>S.S.</u>	<u>R.A.</u>	<u>S.S.</u>	<u>R.A.</u>
Beef Cattle	0.55	2.5	0.75	2.8
Cassava	0.55	2.5	0.75	2.8
Legumes	0.05	0.0	0.60	2.2
<u>Secondary emphasis:</u>				
Swine	0.15	0.7	0.25	0.9
Rice	0.25	1.2	0.25	0.9
Maize	0.15	0.6	0.15	0.5
Production Systems	0.10	0.5	0.25	0.9
Total	1.80	8.0	3.00	11.0

^{1/} Cross-commodity studies and training activities are charged to the appropriate commodities.

^{2/} S.S. refers to senior staff economists and R.A. is research assistants and associates.

to limit the welfare of the labor, producer and/or consumer sector in the lowland tropics.

3. Be expected to make a significant contribution to the overall CIAT research and training effort and/or that of collaborating agencies by helping allocate research resources, and/or forming a component of a "new technology package", and/or helping guide private and public decision-making to improve the impact of the overall research.

4. Fill an existing gap in economics research taking into account work in progress by other agencies.

5. Relate to, or have implications for, a larger geographical area within the lowland tropics. Projects with a high level of transferability of results and/or methodology across country boundaries should be given priority. Complete transferability among countries in the lowland tropics of Latin America would not be a realistic criteria in all cases. Highly specific projects may be carried out to demonstrate the importance of a particular type of project.

Among those projects that fulfill the above criteria, the selection will be based on the relative importance of the project with respect to criteria 2 and 3 and the relative transferability.

Project execution

Considering that the CIAT research activities are of a multi-disciplinary problem-solving nature, each agricultural economics project should integrate with biological, technical, social and economics research carried out on the subject, whether by CIAT or collaborating agencies, in so far as such integration can be expected to improve the efficiency of the overall

research effort.

While initially most of the projects are being carried out by the Program in collaboration with Colombian agencies, attempts will be made to select the project location exclusively on the basis of relative project efficiency as estimated on the basis of the above mentioned criteria and the interests of the national agencies. Furthermore, a larger portion of the Program resources may be allocated to helping national agencies carry out research projects relevant to the overall CIAT activities, if such collaboration should be wanted. It is hoped, that by making available the methodology tested in Colombia and demonstrating the usefulness of the results obtained, national agencies in the lowland tropics of Latin America will be interested in carrying out similar projects to the extent that they feel that such project are needed.

Hence, to summarize, that while most projects are presently being carried out by the Program in collaboration with national agencies, a majority of future projects should preferably be carried out by national agencies in collaboration with the Program.

Whether such a development is feasible would depend on the capability of the Program and CIAT in general and the interests and capability of the national agencies.

Projects completed and in progress

Below is given a listing of projects completed or in progress as of May 1, 1972. These projects will be discussed in some detail in the annual program report to be issued in January, 1973.

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Below is given a listing of projects completed or in progress as of May 1, 1972. These projects will be discussed in some detail in the annual program report to be issued in January, 1973.

Projects completed

1. The cost of producing rice in selected Latin American countries.
2. An analysis of the price structure for rice in Latin America.
3. The feasibility of using Opaque-2 maize for human consumption in Colombia.
4. The economic feasibility of replacing ordinary maize by Opaque-2 maize in life cycle swine diets.

Projects in progress

1. A description and economic analysis of existing beef cattle production systems in the lowland tropics of Latin America. Phase I: The North Coast Region of Colombia.
2. World cassava production and yield trends 1960-69.
3. A description and economic analysis of existing cassava production systems in the lowland tropics of Latin America. Phase I: Colombia.
4. An analysis of the cassava price fluctuations in Colombia (in collaboration with Caja Agraria).
5. Present and future market potential for cassava - a global analysis (in collaboration with University of Guelph).
6. A description and economic analysis of swine production and marketing systems in selected regions of Colombia.
7. The economic feasibility of untraditional utilization of increasing rice supplies in Latin America.
8. An analysis of factors associated with low yields in maize in Latin America. Phase I: Selected regions of Colombia.

9. The diffusion process related to hybrid corn in selected regions of Colombia (in collaboration with the Communication program).

10. The economic feasibility of utilizing rice, maize and cassava for partial wheat import substitution in Latin America.

11. The income, price and cross elasticities for basic foods, a case study of the city of Cali, Colombia.

TRAINING

The Agricultural Economics training efforts may be divided into two parts:

1. Training of Agricultural Economists.
2. Training of Agronomists, Veterinarians, Animal Scientists and other participating in the CIAT Crop and Livestock Production Training Programs.

Training of Agricultural Economists

The objectives of this part of the training activities are:

- a) To teach the trainee how to identify, establish project priorities and carry out agricultural economics research relevant to the agricultural and general economic situation of the country or region.
- b) To teach the trainee how agricultural economics research relates to research in the biological and other social sciences and to demonstrate how multidisciplinary research may be carried out.
- c) To make the trainee familiar with the rural way of life and to teach him how to communicate with farmers.

d) To promote a high level of self-sustained professional motivation and initiative in the trainee.

The training program is carried out utilizing a "learning-by-doing" approach. The trainees participate in all phases of one or more research projects in various seminars and workshops held by CIAT and collaborating institutions on matters related to the economic, biological and technical aspects of agriculture. Each trainee spends some time associated with one of CIAT's field research projects carried out away from the CIAT headquarter. Frequently, the trainees will have the opportunity to participate in field surveys carried out by the Agricultural Economics program.

Within these broad guidelines the training program is "tailored" for each individual trainee on the basis of his professional background and interests and the desires of the institution where he will work upon completion of the training program.

It is hoped that a framework can be organized within which the economists can be supported beyond their training period. Such support might include periodic visits by CIAT economists to the institutions where the former trainees work and workshops on relevant issues.

Due to lack of resources and high priority on research, the training activities have been very limited. Three economists have completed training programs and one is presently enrolled.

Economics training offered to crop and livestock production trainees

The objectives of this part of the training activities are:

1. To make the trainee aware of the relevance of economic analysis to his work in plant or animal sciences.

2. To teach the trainee how to develop or modify experimental designs so that the results obtained may lend themselves to economic analysis.
3. To teach the trainee how to perform simple economic analysis.
4. To make the trainee aware of the macro economic issues such as factor and product markets and public policy to understand the relationships between these issues and decision-making at the farm level.

These objectives are sought met through lectures, workshops, case studies and personal guidance. The proportion of the total training time granted to agricultural economics vary among training courses.

Agricultural Economics participated in the first CIAT animal production training course and the first CIAT crop production training course by 12 and 39 hours of lectures and workshops respectively. It is planned that the agricultural economics contribution to the second CIAT animal production training course will be 16 hours of lectures and workshops and 6 hours of case studies and practice sessions. In addition to the above mentioned, the Agricultural Economics program participate in training sessions on regional development issues and program and trainee evaluation.

Another type of training activities relates to the participation of the Maize program and crop production trainees in socioeconomic farm surveys. To obtain basic information for the Opaque-2 feasibility study mentioned earlier, a survey was made in six maize producing regions of Colombia. After a short introduction to interviewing techniques, six trainees from the Maize program went to the field to interview about 30 farmers each. It was apparent that the trainees' ability to communicate with farmers and their understanding of the real farm problems improved greatly during the period of interviewing.



The field survey to obtain information for the study on factors associated with low maize yields was similarly associated with training of agronomists. After two weeks of intensive training in interviewing techniques and diagnosis of maize production problem, a group of seven crop production trainees visited some 300 small maize producers and 50 input suppliers in three regions of Colombia. During the visits the trainees made personal observations on the maize crops and interviewed the farmers on agronomic and socioeconomic aspects of maize production. Involvement of the crop production trainees in socioeconomic field studies, as the above mentioned, helps them learn to interact effectively with the farmers and understand the farm problems in their real context.

COLLABORATION WITH OTHER ENTITIES AND RESEARCH CONSULTING

The Agricultural Economics activities are highly integrated with the activities carried out by other CIAT programs in multidisciplinary problem oriented research. Furthermore, the Agricultural Economics program attempts to make available to other CIAT programs requested statistical and economic information.

The Program collaborates with a large number of institutions outside CIAT, only a few of which will be mentioned here. Collaborative work is being carried out with 1) Universidad del Valle (supervision of graduate students on thesis projects related to the CIAT work and occasional lectures and seminars); 2) the Colombian Agricultural

Institute, ICA (on various research projects); 3) the Interamerican Institute of Agricultura Sciences - IICA (collaboration with the Andean Zone Marketing Program on Seminars and short courses in various countries. Present emphasis is on marketing and public policy with respect to increasing supplies of rice); 4) the Ecuadorian Institute of Agricultural Research - INIAP (advisory services on the establishment and maintenance of an agricultural economics program); 5) the University of Guelph, Canada (Cassava demand study).

Collaborative research with the Ford Foundations Colombia office is presently being considered. Close links have been formed with the economists at the three organizations CIMMYT, Mexico; IRRI, Phillipines and IITA, Nigeria.

APPENDIX 1

Organization of research units

The program personnel will be organized into three research units by the end of 1972. Each unit will include one senior staff economist and 3-4 research assistants and associates. Each unit will have primary responsibility for economics research related to two or more of CIAT's commodity programs. The organization of the units is subject to change as determined by changes in research needs and priorities. Table 2 shows the planned organization of the units for 1973.

TABLE 2. ALLOCATION OF PERSONNEL ON RESEARCH UNITS, 1973

<u>Commodity</u>	<u>Research Units</u>						<u>Total</u>	
	<u>I</u>		<u>II</u>		<u>III</u>		<u>S.S.</u>	<u>R.A.</u>
	<u>S.S.</u>	<u>R.A.</u>	<u>S.S.</u>	<u>R.A.</u>	<u>S.S.</u>	<u>R.A.</u>	<u>S.S.</u>	<u>R.A.</u>
Beef Cattle	0.05	-	0.70	2.8	-	-	0.75	2.8
Cassava	0.05	-	-	-	0.70	2.8	0.75	2.8
Swine	0.05	-	0.20	0.9	-	-	0.25	0.9
Rice	0.05	-	-	-	0.20	0.9	0.25	0.9
Maize	0.15	0.5	-	-	-	-	0.15	0.5
Legumes	0.60	2.2	-	-	-	-	0.60	2.2
Production Systems	0.05	0.3	0.10	0.3	0.10	0.3	0.25	0.9
Total	1.00	3.0	1.00	4.0	1.00	4.0	3.0	11.0

APPENDIX 2

Program professional staff

The professional staff size during the last two years and planned for this year is illustrated by the following figures:

	<u>Senior Staff</u>	<u>Research Assistants and Associates</u>
Staff on 1/1-1970:	2 <u>1/</u>	0
Staff on 1/1-1971:	2 <u>1/</u>	4
Staff on 1/1-1972:	1	7
Staff on 5/1-1972:	1	9
Planned by the end of 1972	3	11

1/ One of whom was on a joint appointment with Universidad del Valle.

Professional staff as of May 1, 1972

<u>Name</u>	<u>Position</u>
Per Pinstруп-Andersen	Leader of Program
Vicente Anibal	Research Associate
Eduardo Cadavid	Research Associate
Rafael O. Diaz	Research Associate
Rubén Dario Estrada	Research Associate
Néstor Gutierrez	Research Associate
Efrén Varela	Research Associate
Norha de Londoño	Research Assistant
Libardo Rivas	Research Assistant
Carmen Helena Tróchez	Research Assistant