

TROPICAL AGRICULTURAL RESEARCH AND TRAINING CENTER

CATIE

TURRIALBA, COSTA RICA

CATIE-ROCAP PROJECT ON  
SMALL FARM CROPPING SYSTEMS

1. Explanation of the Project

Purposes

The purpose of the Small Farm Cropping Systems Project is to create a coordinated regional approach of investigations for improving the cropping systems used by small farmers. The investigations undertaken will be aimed at evaluating the economics, nutritional and employment effects resulting from alternative uses of production inputs such as improved varieties, fertilizers, pesticides or cultural practices in existing or in new cropping systems.

The term "Cropping Systems" refers to planting combinations and sequences of annual and perennial crops grown on the same piece of land during defined production periods. Mixed farming, including animals, pastures, and woodlands may be part of a farming system and thus contribute to or benefit from the cropping systems under consideration. Inter-cropping, relay cropping and sequential cropping are all aspects of the multiple cropping systems which will be studied in the investigations.

The studies are expected to contribute to the national goals of the Central American countries for increases in production of basic food crops, and improvement in the family income, employment and nutrition of the rural population. The information derived from the studies, which is helpful in attaining these goals, is to be disseminated through national

and coordinated information systems and extension services.

### Organization

The Project will make use of the permanent professional staff of CATIE who are engaged in its Farming Systems Program, an enlarged professional staff made possible by the Small Farm Cropping Systems Project financed by ROCAP-AID, and professional personnel made available by the cooperating Central American countries.

The permanent CATIE staff members will take part in all aspects of the program. Their participation will include some training programs and investigations as well as coordination of planning, data analysis and reporting executed at the Turrialba Center. They will also participate in the field investigations to be carried out on the basis of the national plans and programs in each cooperating country.

The enlarged staff financed by ROCAP-AID Small Farm Cropping Systems Project will be located both at the CATIE headquarters and in the cooperating countries. One member of the staff will be stationed in each country to cooperate in the day-to-day field activities. In addition there will be about five specialists who will spend half or more of their time working on the investigations in the cooperating countries and the rest of it on planning, training and data analysis at the CATIE headquarters.

The professional staff assigned to the Project in the cooperating countries will take part in planning, execution, data analysis and training for their countries and in the coordinated planning and reporting for the project as a whole.

Strength will also be provided to the program through several additional technical assistance projects, including projects on soil fertility and

on information service supported by ROCAP-AID and on water management, weed control and seed technology supported by USAID through contracts with Utah State University, Oregon State University and Mississippi State University.

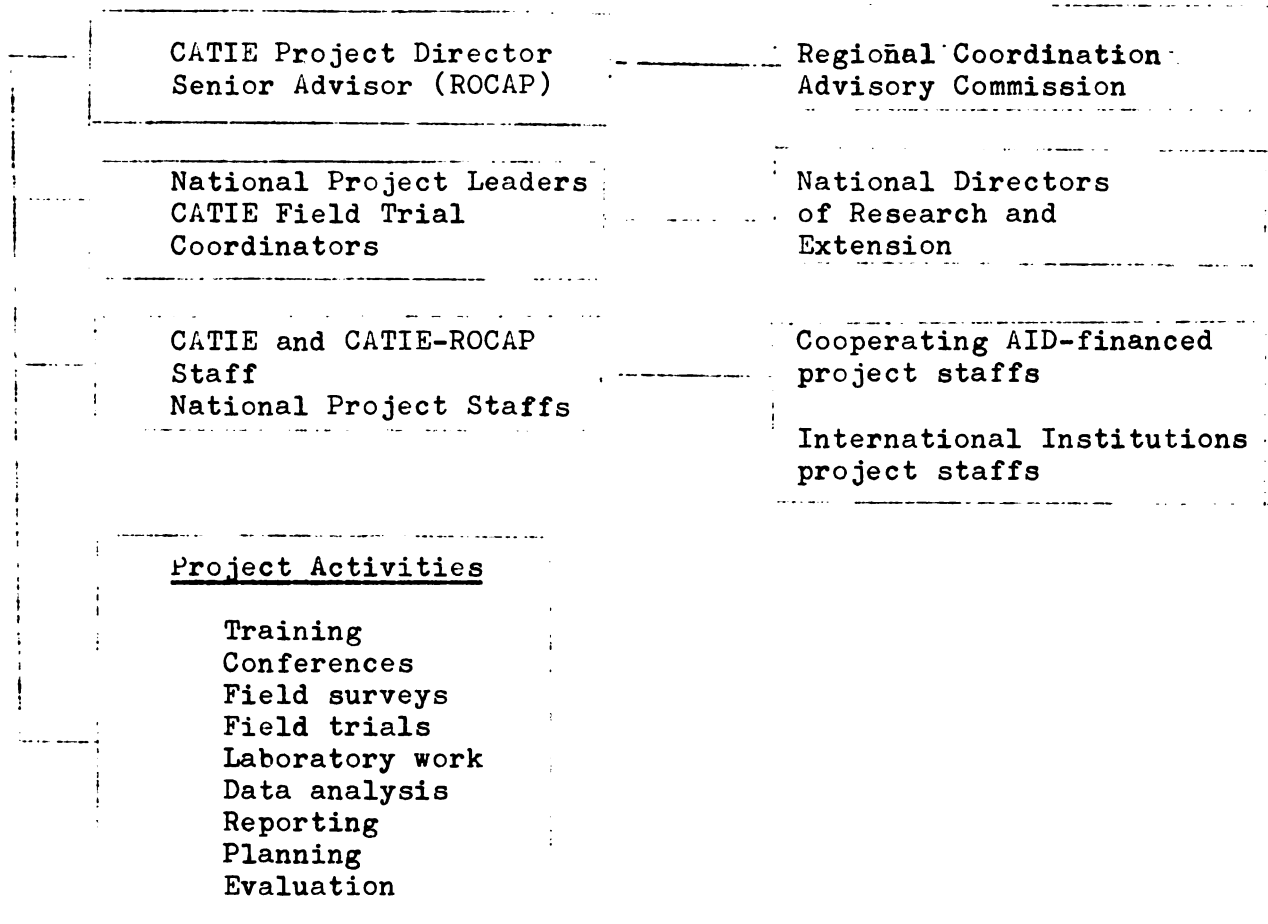
The relationships between the CATIE, CATIE-ROCAP and cooperating countries personnel and the activities under the Project are illustrated in the following chart. As the chart shows, a Regional Advisory Commission composed of Directors of Research and Extension of cooperating countries will advise the CATIE Project Director and ROCAP Project Manager. The Directors of Research and Extension will also continue to direct the activities of national staff members involved in the Project, through their national project directors. Cooperating AID-financed project staff and International Institutions staff will work with the CATIE and CATIE-ROCAP staff with a minimum of bureaucratic intervention.

### Procedures

Since it is the objective of this Project to provide the basis for a continuing regional approach to the improvement of cropping systems for small farmers, all of the procedures maximize the involvement of the Directors of Research and Extension, and the Project personnel of the cooperating countries in the planning and execution of the Project at all levels. The appropriate procedures for the Project activities differ enough to make a brief explanation of them for each major activity desirable.

### Training

Training will be confined to staff members of the cooperating countries, or Latin American countries which are undertaking similar

RELATIONSHIPS BETWEEN ADVISORY AND MANAGEMENT FUNCTIONS

programs for improvement of small farmer cropping systems. Two kinds of training are planned:

1. Intensive courses or seminars which bring together technical workers from different countries.
2. In-service training for technical workers on-going programs of the project.

The intensive courses and in-service training may be either to give necessary background in the purposes and procedures of the project or to give improved understanding of technical aspects of the project such as insect and disease control or soil fertility and agronomic practices. The subjects on which the training programs will concentrate and their scheduling will be determined in consultation with the Directors of Research and Extension of the cooperating countries who will select the individuals to be trained.

The intensive courses will be under the leadership of CATIE, but will make full use of technical staff members of the cooperating countries and other technical assistance programs in the area. The intensive courses and the in-service training may be held either at CATIE Turrialba or in cooperating countries.

The ultimate purpose of the training program is to help the staff of cooperating countries become fully qualified to carry the national and regional activities by the end of the project without outside technical assistance.

### Conferences

Three levels of conferences are contemplated:

1. Annual meetings of the Regional Advisory Commission for the project.

2. Annual Regional Conferences of the Project Collaborators for the cooperating countries with the CATIE staff.
3. Annual National meetings of the project collaborators.

The Regional Advisory Commission, composed of the Directors of Research and Extension of the cooperating countries or their representatives and the CATIE Project Directors, will advise on the planning and execution of the project, on the basis of the needs of the countries and reports of the activities under way. Their meetings will be held at locations and times determined by the Commission, whose chairman will be chosen by it annually.

The Annual Regional Conference will be held each year in early December at CATIE Turrialba. Reports of the result of the previous year's work in each cooperating country will be used as a basis for planning the coming year's work. The annual report for the year will be based on this conference.

The Annual National Meetings of Project Collaborators will be held in November each year in each country. Reports of project results within the country will be presented and discussed in preparation for the coming Regional Meeting in Turrialba.

### Field Surveys

The first Field Surveys in each country will be conducted in January and February of 1976 in the socio-ecological zones where the subsequent field studies are to take place. The survey will be determined on the basis of a conference with experts in the subject and subsequent consultations. Their purpose will be to find out the cropping systems used, the special problems and the kinds of changes that are likely to improve family

income, nutrition and labor utilization under prevailing climatic conditions for each zone. On the basis of these initial surveys, the first year's field trials and satellite investigations for the zone will be determined, and cooperators will be selected. In addition to the initial surveys there will be annual detailed surveys of selected average small farms to determine the family income, nutrition, labor utilization, and input-output under climatic conditions and the farming systems of the year.

#### Field Trials and Satellite Experiments

The field trials will be carried out on land of cooperating farmers in each socio-ecological zone. They will be simple and provide as much as possible for visual evaluation by farmers, of the differences between existing and promising new cropping practices and more adequate land use.

In each zone, several field trials will be maintained each year, and to the extent possible, the cumulative effects of cropping systems will be studied over the four year period of the project. Thus, in each crop cycle new multiple cropping and crop succession options will be compared with existing ones, and over the four year period the effects of different rotations may be compared.

The satellite experiments will be carried out on local field stations of the Ministry of Agriculture of the cooperating countries and at CATIE Turrialba. These experiments will be designed in accordance with section 5, and will provide opportunities to test promising varieties, new crops, insect and disease control practices and ~~fertilization and agronomic procedures~~ under the climatic conditions of the zones involved before the best of them are selected for use in farmer trials.

### Laboratory work

The field trials and satellite experiments will require several kinds of servicing by the laboratories of Turrialba Center. These will include chemical analysis of soil samples, and plant materials and clinical examination and diagnosis of disease, insect and nematode problems. A system for prompt analysis and reporting will be set up. In service-training for technical staff members of cooperating countries will be provided. If desirable, laboratory work will also be done at INCAP and CIMMYT.

### Data Analysis and Reporting

Data analysis and reporting in a regional project of this kind require a uniform system of data collection and observation and the necessary forms for them will be agreed upon.

It is expected that all data and observations from the surveys, field trials and satellite experiments will be summarized promptly at the national and regional levels so that they will give a basis for the annual plans for the work in the following year. This will require preliminary computation at the field level and coordination of the results from the field by use of the computer at CATIE-Turrialba.

All results will be made available at the national and regional levels. In addition, a data bank and file on climatic and soil information and the farming systems of small farmers in Central America will be maintained. The regional reports to be provided will include a report on the "State of Art", explaining the survey results, annual reports on the results of the field trials and satellite experiments, and a final report giving recommendations of improved cropping systems.



## 2. Selection of socio-ecological regions for study

The zones for study will be selected so as to represent the most important climatic regions of Central America, and they will be areas where there are concentrations of small farmers with established cropping systems. These zones should include the following, according to the ecological classification of L. R. Holdrige and general observations on Central American farming systems made by James L. Walker.

### I Low Mountain Moist-dry areas (Altiplano)

#### A. First planting following dry season

Peg crop (first planted, last harvested): Corn

Ancillary crops: Beans, Squash, Garden Peas, White Potatoes,  
European Broad Bean

#### B. Second planting

Peg crop: Wheat, Potatoes, Vegetables, Milpa

Ancillary crops: European Broad Bean

### II Dry to Moist-Dry Areas in Pacific Tropics

(Coastal plain and low piedmont)

#### A. First planting following dry season

Peg crop: Corn, Beans, Rice, Sorghum, Cassava

Ancillary crops: Beans, Sorghum, Melons

#### B. Second planting

Peg crop: Corn, Sesame or Sorghum

Ancillary crops: in combination with one of above

### III Moist -dry subtropical areas (inter mountain valleys)

#### A. First planting following dry season

Peg crop: Corn, Beans, Sorghum

Ancillary crops: Beans, Sorghum, Vegetables

B. Second planting

Peg crop: Corn, Sesame, Sorghum, Beans, Vegetables

IV Moist Tropical Caribbean Lowlands

A. First planting of annual crop cycle

Peg crop: Rice, Corn, Beans, Cassava

Ancillary crops: Beans, Vegetables

B. Second planting: Rice

The small farmer as defined in this Project is one who provides a major portion of his subsistence from his own crops, whose family is the main source of labor, and who has little or no access to farm machinery or work animals as supplementary sources of power. The actual size of the unit is of less significance than these criteria but is usually less than 5 hectares.

Selection of the socio-ecological zones to be studied in each country will be made as a result of the initial discussions with the Directors of Research and Extension. The decisions will take into account the programs of research and extension under way and the national agricultural goals of the country. In each case the CATIE project work in the country will be designed to complement activities under way, in order to maximize the progress made by the country in achieving its goals. These decisions should be made in October 1975 if possible and at this time a general Memorandum of Agreement will be drawn up describing the inputs and activities of CATIE and the cooperating country. Annually, a more detailed statement of the field trials, satellite experiments and training activities in each country will be attached to the Memorandum of Understanding. An example of the General Memorandum of Understanding is given in appendix 1.

At the time that the Memorandum of Understanding is agreed upon, the Director of Research in the cooperating country will designate a national director for the project. He, in turn, with the approval of the Director of Research, will designate the additional technical personnel who are to cooperate in the project.

### 3. Surveys of the existing situation and selection of cooperators

#### Initial base-line surveys

An initial base-line survey will be made in each of the zones selected for study. The field work will be done by a team of several persons, representing the cooperating country and the CATIE Project.

The survey will be made with the cooperation of local community leaders in the principal aldeas of the zone, who will furnish general information on the socio-economic and agronomic questions to be answered. Prior to interviews of the local community leaders, a map will be drawn of each zone, and all available information on climate, soils, and land classification will be placed in the survey records.

At the time that the survey is made local leaders will be asked to provide the names and addresses of small farmers who represent the average and above average situation in the area of the aldea, and who may be willing to cooperate in more detailed studies of their farming systems and in field trials on their farms. The survey will then be conducted on the basis of a sampling procedure previously agreed upon.

The initial base-line survey will be summarized for each zone and the summaries coordinated for the regional study during March 1976. These results will be discussed on the national levels during March and preliminary plans of action for each country in 1976 will be made. The plans

will list the kinds of field trials and satellite experiments that appear to be needed in each zone.

#### Subsequent base-line surveys

In the first two months of each year beginning in 1977 subsequent survey will be made in each of the zones. These surveys will consist of interviews with the selected average and above-average farmer cooperators interviewed in 1976. Details of the actual farming system on each farm the labor, materials, and capital inputs, and the resulting yields, family food and income will be recorded. The data will provide a basis of comparison for measurement of the effects of controlled and uncontrolled changes in cost-benefit during the four years of the project.

#### 4. Agreement on field trials and satellite experiments and the budget and a calendar to be followed

The information from the initial survey and subsequent survey in each zone will be discussed at meetings with the cooperating personnel in each country. Agreement will be reached on the key problems confronting the small farmers in the zone and the most promising ways to attack those problems. The subjects selected for farmer field trials will deal with comparison of the farming practices used with those which are very likely to provide important improvements in yield of food crops and or additional family income. Tests of potential practices which require further study, before being put into farmer field trials, will be incorporated in satellite experiments in the zone. Agreement on the work for the coming years at these two levels will be reached in April. A tentative budget and calendar of events will be part of the agreement. This will form the basis for arrangements with cooperators, purchase of necessary supplies, and scheduling of activities for the coming year.