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CENTRO AGRONOMICO TROPICAL DE INVESTIGACION Y ENSEÑANZA
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C I D I A
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FARMING SYSTEMS IN CENTRAL AMERICA

Proposal
for the
Second Project Phase

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INFORAT

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PROPOSAL FOR THE SECOND PROJECT PHASE

1. Foreword

The orientation towards the target group "small farmers" aims to make a contribution in combating the poverty of a large number of people in Central America. During the first project phase the CATIE - GTZ Project team has selected two areas in mountainous regions in Costa Rica and Nicaragua. These regions are situated in one of the major ecological zones, the "Wet-Dry Tropics", which in Central América constitutes 37% of the total area and sustains 50% of the total population. 80% of the farmers in the project areas own less than 10 ha, their capital resources are low and family labour is a major production input. The economic situation of these small farmers has deteriorated during the last years due to the rapid price increase of inputs of non-renewable resources.

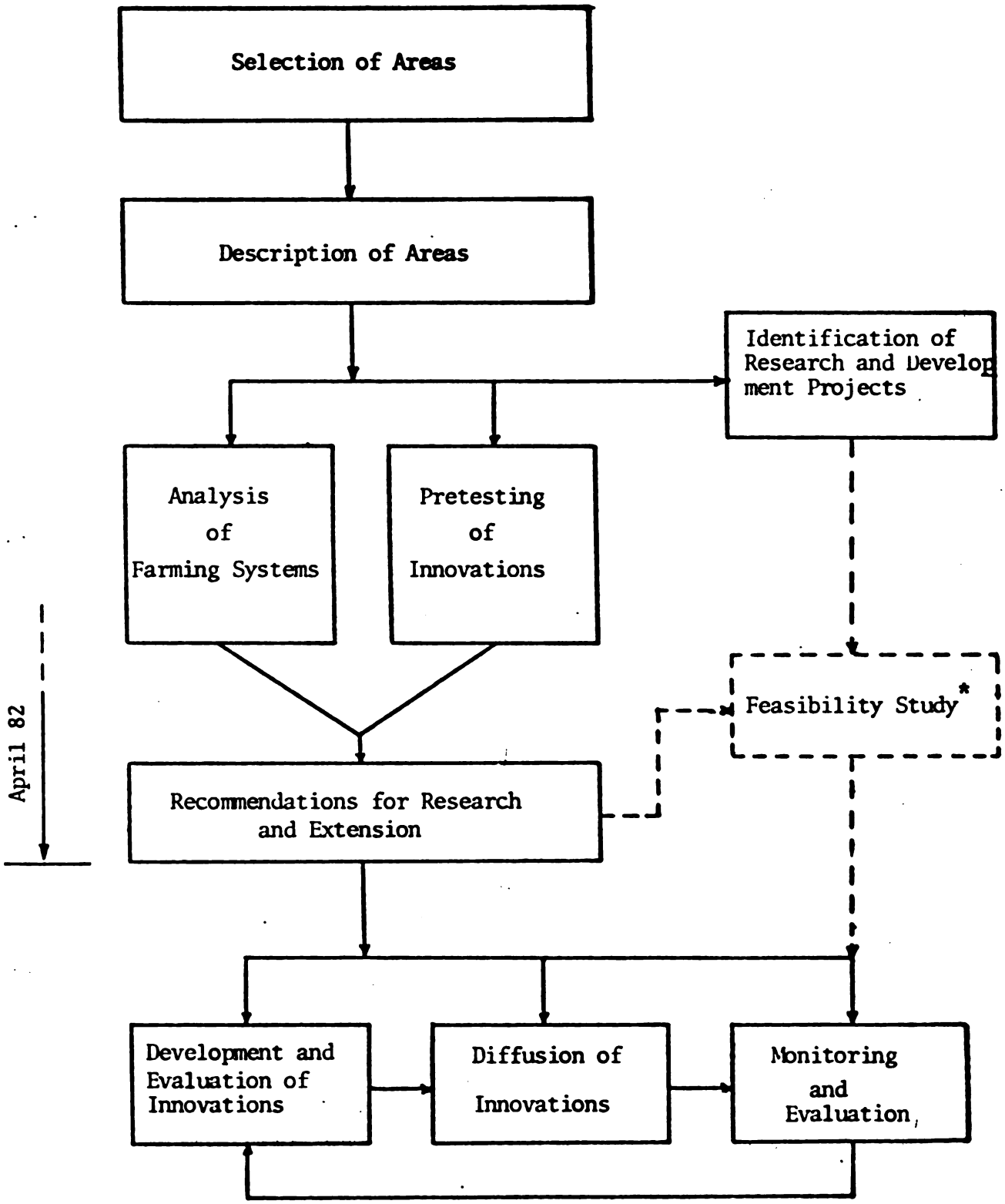
2. Achieved and expected results from the first phase

At the beginning of the project the methodology of the Farming Systems Project was developed. The major activities have been divided into various phases (see diagram) which facilitates systematic planning and control of the project activities.

The Farming Systems Research Approach analyses the farm (production unit) and the household (consumption unit) in a comprehensive manner. This holistic perspective requires - apart from the farm analysis - an analysis of the physico-biological and socio-economic conditions under which the farmers are living. The analysis of the existing farming systems will devote special attention to the goals of the farmers and the constraints on the achievement of these goals.

From June to September 1980, the project team collected information on possible project areas and visited in collaboration with other CATIE scientists and members of national institutions various regions in Panamá, Costa Rica and Nicaragua. Finally one project area in Costa Rica and another one in Nicaragua were selected because they best fulfill the

PROJECT PHASES



* A feasibility study will not be conducted by the research team, but assistance could be given.

major selection criteria:

- population density and number of small farmers.
- standard of living
- region with national preference
- accessibility and infrastructure
- agricultural potential

The next step conducted between October 1980 and January 1981 consisted in describing the two selected areas. The "Area Description" concentrated on the physico-biological and socio-economic environment of the two project areas and an analysis of the farm characteristics. This information was collected with a one-visit survey of about 500 farmers. The most important results were the following:

a) Project area: Acosta-Puriscal, Costa Rica

The farming systems are highly diversified. Farmers cultivate 1-2 ha annual crops as well as perennial crops. Beside these intensively used areas they have 2-5 ha under extensively managed natural pastures.

Soil erosion is one important problem on the slopes, especially under natural pastures and on land under annual crops. Soil erosion control is actually not adequate to prevent this major problem. Another constraint to increased production is the scarcity of labour during peak labour demands. Coffee plants are generally old and of low productivity. 65% of farmers' land is actually under pasture with an extremely low production. An improvement of the pasture land could increase farm production and income drastically.

b) Project area: Jinotega, Nicaragua

The farming systems are adapted to the varying ecological conditions in this project area. Annual crop production plays the most important role and usually occupies between 2 and 3 ha per farm. Perennial crops are produced in parts of the area and on average each area per farm under perennials has about 1 ha. Only 45% of the survey farmers have land under pastures with an area between 2 and 8 ha. The poverty of the small farmers

is very high, apparently due to the low production of crops, and the evident lack of physical and social infrastructure. The low rate of fertilizer use, improved seed and the lack of insect and weed control seem to be the most important constraints in annual crop production. Coffee fields suffer from lack of maintenance and availability of improved varieties. The potential for annual and perennial crops in the project area seems to be high.

With the information collected the project team assisted the national institutions in identifying research and development projects and in preparing project proposals.

The multi-visit survey, with about 70 farmers in each of the two project areas was started in February 1981. Farmers are visited weekly throughout one year, which means that the survey will end in February 1982. The data are immediately transferred to diskettes for computer analysis, checked for missing information, consistency, and for data falling outside what experience suggests to be reazonable upper and lower limits. At the end of February all data will be transferred and checked, so that the major analysis can be conducted immediately. A standard program adapted to the project's questionnaires will be used so that the analysis can be executed during about 2 weeks.

Results from the first cropping period indicate that production of maize per ha in Acosta - Puriscal is about twice (2t/ha) as high as compared to the data in the last agricultural census. This information leads to the assumption that - under the given topographic conditions - maize production has already reached a relatively high level and that the difference between actual yields and the potential yield under farmer's conditions is not very high.

The situation of maize production in Jinotega is the opposite. Actual production is on average less than 1t/ha, and the information from experiments indicate that potential production under farmers conditions could be about 3t/ha.

The preliminary test of innovations, started in May 1980, consist of two parts:

1. experiments with zero-tillage (maize-production)
2. tests of technical packages on farmers' fields (maize and beans production)

The fields have not been harvested and the results are not yet available. However, from the vegetative growth of the plants it can be said that zero-tillage seems to be a promising technique under the existing ecological conditions. The maize packages tested on farmers' fields show only a minor improvement in comparison to farmers fields in Acosta-Puriscal, whereas the plots in Jinotega are clearly better than farmers fields.

At the end of the first phase (April 1982) a detailed agro-economic description and analysis of the actual farming systems will be available as well as the analysis of the exploratory experiments. With this information, recommendations can be given with regard to research priorities and extension packages to be channeled through the national institutions.

The direction of CATIE has evaluated the project's activities and results and is highly satisfied with its achievements. The project team has worked efficiently and executed the various phases without any delay.

3. Project Objectives

The long-term objectives are to develop and diffuse production systems which could increase actual production and hence the general well-being of small-holders in selected areas of Central America.

For the second phase the project could concentrate its activities into two directions:

1. Expansion in the horizontal line, which means that the same type of farming systems analysis will be conducted in different areas, and/or
2. Expansion in the vertical line, which means continued work in the same areas with concentration in developing production systems and analysing (validation) of technical packages.

The CATIE Directorate would like to combine both mentioned directions, which means a) the application of farming systems analysis in a different ecological zone and b) the development and analysis of production systems. In this last case major emphasis should be given to mixed production systems with the incorporation of crop, livestock and forestry components.

The proposed objectives of the second phase are:

- Analysis of farming systems in a semi-arid area (Honduras or Panama) with special emphasis in training of national personnel in data collection and analysis and in project planning.
- Preparation and conduction of short-term courses for Ms-students in farming systems analysis.
- Development and analysis of mixed production systems in the areas Acosta-Puriscal and Jinotega.
- Validation of technical packages in collaboration with farmers and national institutions in Acosta-Puriscal and Jinotega.

4. Working Program

The analysis of farming systems in the semi-arid area of ..... will be conducted with the same methodological approach used during the first project phase. The experience gathered under the Central American conditions will be applied and on-the-job-training conducted for national personnel. The agronomic work in this area will be the task of other scientis from the annual crops department.

With the limited financial and personnel resources it is necessary to concentrate on the most promising activities within the areas Acosta-Puriscal and Jinotega. Because the recommendations of major research priorities can only be regarded as possibilities, which have to be discussed in detail at the beginning of the second phase.

The development of mixed production systems needs the collaboration of specialists of various disciplines from all CATIE - programs. This will be obtained by a close interaction with an Agro-Forestry Specialist (CATIE-GTZ

Project on Agro-Forestry), an Agronomist (CATIE-ROCAP Project on Small Farm Cropping Systems), an Agrostologist (CATIE-CORE Budget) and a Livestock Specialist (CATIE .....).

4.1 Proposed activities in .....,

- Description of the area with emphasis on physico-biological and socio-economic environments, identification of farm resources and most important farm enterprises.
- Analysis of farming systems. Data collection will be done with one-visit and multi-visit surveys.

4.2 Proposed activities in Acosta-Puriscal, Costa Rica

- experiments with coffee and various shade and fruit-trees, with and without mineral fertilizer,
- experiments with improved pastures, with trees and without trees, and with and without mineral fertilizer.
- study of effects of management of pastures (various rotations),
- effect of animal manure on various crops,
- validation of technical packages in farmers' fields.

4.3 Proposed activities in Jinotega, Nicaragua

- experiments with minimum tillage for annual crops. This should include testing of oxen drawn seeding and fertilizing machines,
- experiments with bananas and fruit-trees in combination with pig-production,
- experiments with living fences for fence-post, fodder and fuel-wood production,
- validation of technical packages in farmers' fields.

5. Budget Allocations

GTZ personnel costs (Agr. Economist and possible project assistants) are not included in the following figures. All amounts are expressed in thousands of DM (1 US $ = 2,30 DM).

Budget Categories	1st Yr	2nd Yr	Total
1. Personnel Costs[1]			
Research Assistants (Agronomists)(2)	50	50	100
Research Asistent (Agr. Economist) (1)	25	25	50
Bilingual Secretary (1)	10	10	20
Field Assistants (6)	50	50	100
Field Laborers	10	10	20
	145	145	290
2. Travel Costs			
International travel	10	10	20
Regional travel	20	20	40
Travel in Costa Rica	10	10	20
	40	40	80
3. Equipment[2]			
Diesel Jeeps (3)	20	40	60
Motorcycles (5)	-	15	15
	20	55	75
4. Communication Costs			
Office stationary supp.	9	9	18
Photocopying costs	4	4	8
Mimeograph costs	4	4	8
Publications/translations	10	10	20
Telecommunications	4	4	8
Material for audiovisuals	4	4	8
	35	35	70

1) 2 Agronomists and 6 Field Assistants already employed during the first phase of the project will continue working in the areas of Acosta-Puriscal and Jinotega. The Agr. Economist will be employed to supervise field work in the new project area. It is assumed that enumerators will be provided by the national institution who is collaborating in the project activities.

2) 2 of the Jeeps will be replacements for old ones; 1 Jeep and 5 Motorcycles will be used for data collection in the new project area.

Budget Categories	1st Yr	2nd Yr	Total
5. Maintenance and Operation of Equip.			
Office equipment	4	4	8
Vehicles (1 VW + 5 Jeeps)	45	45	90
Motorcycles (5)	15	15	30
	64	64	128
6. Research Inputs			
Field research	60	60	120
Data Processing	5	5	10
	65	65	130
7. Overhead Costs - CATIE			
Overhead costs	70	70	140
8. Other General Costs			
Customs, clearance, freight & insurance	2	2	4
9. Contingency factor			
Contingencies & inflation	30	30	60
	471	506	977