

Atlantic

Zone

Programme

Working Documents No. 2

WORKPLAN SECOND HALF 1987

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Turrialba, July 1987



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The Atlantic Zone Programme (CATIE-AUW-MAG) is the result of an agreement for technical cooperation between the Centro Agronómico Tropical de Investigación y Enseñanza (CATIE), the Agricultural University Wageningen (AUW), The Netherlands and the Ministerio de Agricultura y Ganadería (MAG) of Costa Rica. The Programme, that was started in April 1986, has as a long-term objective multidisciplinary research aimed at rational use of the natural resources in the Atlantic Zone of Costa Rica with emphasis on the small landowner.

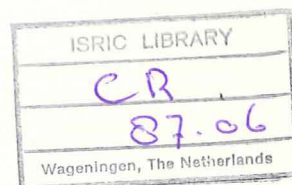
El Programa Zona Atlántica (CATIE-UAW-MAG) es el resultado de un convenio de cooperación técnica entre el CATIE, la Universidad Agrícola Wageningen (UAW) Holanda y el Ministerio de Agricultura y Ganadería (MAG) de Costa Rica. El Programa, cuya ejecución se inició en abril de 1986, tiene, como objetivo a largo plazo la investigación multidisciplinaria dirigida a un uso racional de los recursos naturales, con énfasis en el productor pequeño de la Zona Atlántica de Costa Rica.

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ATLANTIC ZONE PROGRAMME

Working Document No. 2



WORKPLAN SECOND HALF 1987

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Turrialba, July 1987

CENTRO AGRONOMOICO TROPICAL DE
INVESTIGACION Y ENSEÑANZA - CATIE

AGRICULTURAL UNIVERSITY
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	ANNEX 1. DELINEATION OF SUBAREAS	

During the second half of 1987 the baseline study as envisaged in the CATIE/AUW/MAG programme document (ANON., 1987) and started in February this year, will be continued. This study forms the second phase of the survey of Huetar Atlantica, which has as the most important objective the identification of problem areas for future research projects (BOERBOOM *et al.*, 1985). The first phase comprised an exploratory survey, which was carried out in the period April-July 1986. Its objectives were (1) a rapid identification of the most important agricultural production systems, i.e., actual situation and problems, the land units and the socio-economic conditions, and (2) the selection of study areas where the agricultural production systems and their ecological and socio-economic environment can be studied in more detail (baseline study). For the main results of this exploratory survey the reader is referred to a summarizing report by SLUYS *et al.* (1987).

The objectives of the baseline study are (1) identifying the problems besetting the agricultural production systems, and (2) collecting data on the most important transformations as a benchmark for future reference.

Following the exploratory survey two study areas were identified. An area in the north with Cariari, Guapiles and Guacimo as the main centres of activity, and the Talamanca canton in the south. The baseline study was started in three subareas in the northern part of Huetar Atlantica, i.e., Cocori, Rio Jimenez and Neguev. For their delineation see figure 1 and annex 1. Cocori is characterized by transformations from rain forest to pasture and other forms of land use. In Rio Jimenez farmers are forced to intensify because of population pressure, but with little coordinated assistance from government or other institutions. In Neguev the major transformation is from pasture and forest to crops. Neguev differs from Rio Jimenez in that the transformation is guided by IDA.

The baseline study is interdisciplinary. Basically the approach will be from three angles, with emphasis on (1) the land as natural resource, (2) land use and farming, and (3) the socio-economic and institutional context. The study comprises three parts.

- (1) Inventories and surveys. In each subarea the soils will be mapped and evaluated, a broad farm survey will be carried out, and the regional socio-economic and institutional context will be studied.
- (2) Specific studies. Specific topics and problems identified during the exploratory survey or the surveys referred to sub (1) will be studied in more detail.
- (3) Verification. The preliminary findings of the surveys and specific studies will be discussed with farmers, farmers' organizations, extension workers and officials in order to correct, deepen or complete the information. The results will furthermore help to improve the methodology to be used in additional surveys.

During the second half of 1987 the baseline study will be extended to the Cahuita and Sixaola districts in the canton Talamanca. The approach to be used here will be somewhat different from the one used in the earlier mentioned subareas. The planned activities are therefore dealt with in a separate chapter (see 5).

The findings of the baseline study will eventually be published in the form of monographs, i.e., separate reports for each of the subareas.

The work planned for the second six months of 1987 is specified below. Table 1 presents the time table. Though the approach is interdisciplinary, for practical purposes the different elements of the work have been grouped somewhat mono-disciplinary, i.e., in accordance with the three angles from which the problems are being studied.

Table 1. Time table of main activities and reporting schedule for the second half of 1987.

	Jul	Aug	Sep	Oct	Nov	Dec
SOIL SURVEY						
Subareas						
Elsewhere						
FARM SURVEY						
Literature studies and institutions						
SOCIO-ECONOMIC SURVEY						
Literature studies and institutions						
SPECIFIC STUDIES						
Land resources						
Land use and farming						
Socio-economic and institutional context						
TALAMANCA BASELINE STUDY						
Regional survey						
Specific studies						
VERIFICATION AND COMPLEMENTATION						
Integrated						
REPORTING DEADLINES						
Quarterly reports	•			•		
Monographs (drafts)						•

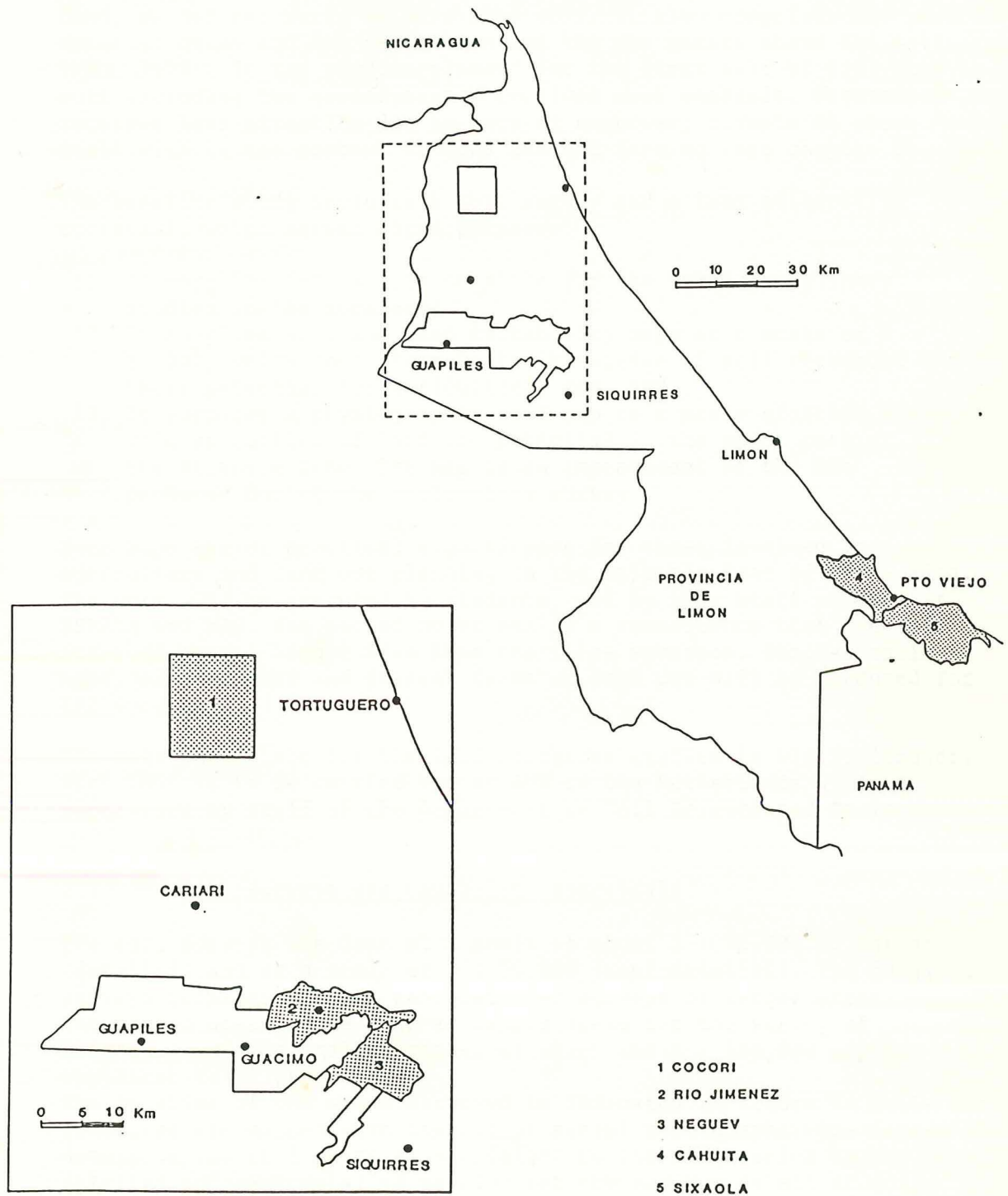


Figure 1. Areas and subareas (dotted) where the soils will be mapped and evaluated during 1987 for the baseline study.

2 LAND RESOURCES

2.1 Introduction

Land, as defined here, is more than soil; it also comprises the parent material below and the vegetation and the air masses above the soil (FAO, 1976). In the studies planned for the first half of 1987, the soil including the geomorphology receives most emphasis. Vegetation receives less attention due to lack of manpower; climate is also dealt with in the context of land use and farming (see chapter 3).

The baseline study includes a soil survey and a land suitability appraisal, which serves three purposes:

- (1) It supplies information on soils for the multidisciplinary studies in the subareas;
- (2) It supplies soil and land suitability maps on a scale of 1 : 50,000, which contribute to the knowledge of soil resources and their potential for agricultural use, and
- (3) It supplies a physiographic soil map on a scale of 1:500,000 with an outline of land use potential in the major part of the Atlantic Zone. The map is an improvement of the one produced during the exploratory survey.

Such maps are of practical significance for those involved in agriculture and land use planning in the Atlantic Zone of Costa Rica. The work will be executed by students, and by some staff members of ASBANA and MAG. The second point has as a consequence that the soil is surveyed over a larger area than the three subareas. Besides soil maps, maps of past and present forms of land use will be produced for the subareas.

The main supervisor for the land resources studies is Wim Wielemaker. Work that is to be carried out at AUW in the Netherlands will be supervised by staff of the Department of Soil Science and Geology.

2.2 Soil surveys and capability appraisals

The soil surveys are done at a scale of about 1 : 20,000 or larger (detailed) and at a scale of 1 : 50,000 (semi-detailed). The detailed surveys form part of the semi-detailed surveys of larger areas. The mapped areas serve also as sample areas for the survey of larger areas at a smaller scale, of which the 1 : 500,000 map is the first to be produced.

The location of the areas surveyed is indicated in figure 1. Soils and landforms are mapped with the aid of aerial photographs. The degree of detail of the soil units is equivalent to the soil series in the detailed and semi-detailed mapping but the maximum detail of soil units of the 1 : 500,000 map will be the sub-group of Soil Taxonomy. In each soil unit at least one profile pit is described and sampled. Description is done according to the FAO-guidelines (FAO, 1977) and classification according to the Soil Taxonomy (SOIL SURVEY STAFF, 1975). The soil survey results will be correlated with earlier work. The suitability appraisal follows the modified U.S. Land Capability System as used in Costa Rica (CCT, 1985).

So far three areas have been surveyed:

- Part of Hacienda Bremen, mapsheet Guacimo on a scale of 1 : 17,500 and with a surface of about 2000 ha.
- The southern part of area 3 (figure 1) on a scale of 1 : 17,500 and with a surface of about 1500 ha.
- Mainly detailed surveys in area 2 and semi-detailed surveys in the non-dotted areas of figure 1.

These surveys cover the subjects 2A1, 2A2, 2A3 and 2A6 of the workplan for the first half of 1987. Reports are presently being prepared and will be completed by the end of August 1987.

2A4 Cocori

About 10,000 ha in mapsheets Tortuguero and Chirripo Atlantico, north of coordinate 2.78, between the coordinates 5.72 and 5.61 (area 1 in figure 1). This survey was preceded by a geomorphological survey in the months of December and January. Surveyors: Quirijn de Jong van Lier and Andre Nieuwenhuyse. The last one continues the work with a soil survey, which will be completed by July 1987.

2A5 Alegria

A geomorphological map and a soil map on a scale of 1 : 35,000 of an area of approximately 5000 ha between Siquirres and Alegria. The survey will be completed by July 1987. Surveyors: Jack van der Wees and Daniel Jeldres.

2A6 Neguev

Completed during the first half of 1987. See above.

2A7 Land use maps

Land use maps of the three subareas are prepared on the basis of interpretation of aerial photographs, thematic mapper images, available literature, maps and field checks. The maps are made for different years to obtain some idea about the transformations in land use. The work was started in the period January-April by a team of land resources and land use and farming students. It will be continued during the second half year with emphasis on the interpretation of thematic mapper images. Student: Sytze de Bruin. Co-supervisor: Henk Waaijenberg.

2A8 Soil variability and soil correlation

A systematic comparison of soils will be done in the areas mapped concerning variability in the range of characteristics and consistency in naming of soils and parent materials. Results of these studies will be used to establish a final legend.

In addition the soil map of the Rio Jimenez subarea will be completed. Period: September-November. Students: Wilbert van Doorenmolen, Joost Schout and Wif Zonnenberg.

2A9 Physiographic soil map on a scale 1 : 500,000

The physiographic map made during the exploratory survey will be checked and corrected. Proper naming of the geomorphological units forms an important base for the establishment of soil associations, which will be named at subgroup level. In addition to the map, the

potential of soil associations for agricultural production will be indicated. Work will start in October/November and continue in 1988. Students: see 2A8.

2.3 Specific studies

In addition to the surveys specific studies are carried out paying attention (1) to the changes the soils undergo as a result of transformations in land use and (2) to the impact this has on the performance of land for agricultural production. The data on soils in combination with crop performance (chapter 3) are integrated for a land evaluation putting emphasis on the selection of sustained forms of land use and the limitations and constraints preventing or hindering such use.

2B1 Physical and chemical characterization of soils with andic properties

Physical properties such as bulk density, moisture retention at 15 bar, liquid limit and plasticity index, and chemical properties such as pH-NaF and P-retention, are indicative for the clay mineralogical composition of soils with andic properties. The mentioned characteristics are strongly related to engineering properties and to the fertility of such soils. Forest clearing and consequent changes in land use usually have an important impact on the same characteristics. Determination of those characteristics and an estimate of land use on it, is important for separation of soils with andic properties and for an evaluation of their fertility and engineering properties. This study was started in April. Student: Jetse Stoorvogel.

2B2 Structure formation and degradation in relation to land use

Processes of structure formation and degradation are greatly affected when forest is cut and other types of land use introduced. Which changes occur in forms of structure, how this relates to the activity of soil fauna and to the land use system and what it means for physical soil characteristics such as bulk density, porosity and infiltration rates, are important questions for the research on three soil types in the Neguev, where profiles will be studied under forest and several other types of land use.

Morphological field characteristics were studied in the months of October and November 1986; chemical and micromorphological characteristics are being studied in the Netherlands. Student: Angelique Lansu.

Physical characteristics of the same soils were studied in the months of May and June 1987. Student: Egbert Spaans.

2B3 Effect of clearing on soil properties

It was noted that clearing has an important impact on physical soil properties, which may persist in the soil over a long period of time and thus influence rootability and availability of water and oxygen for plants. The effect of clearing on morphological, physical and biological properties of soils in the Cocori area was studied in the period January-April. Forest cover maps for different years were produced. Soil samples are being analysed in the Netherlands where also the report is written. Student: Gerard Baltissen.

2B4 Soil compaction, pasture composition and pasture productivity
Field work completed during first half of 1987.

2B5 Nutrient availability in some soils of the zone
Pot experiments are being carried out in the Netherlands with samples of three representative soil units in order to determine their fertility levels under controlled conditions. Student: Hans Janssen. This research was followed up by a field study in all subareas with maize as indicator crop. See also 3B6. Student: Olaf Erenstein. Co-supervisor: Henk Waaijberg.

2B6 Potential productivity of soils for banana
Bananas are of great economic importance for the zone. Potential production is studied in relation to varying availability levels of radiation (light), water, oxygen and nutrients. Data will be collected on three experimental farms of ASBANA for which climatic data, chemical analyses of soils and leaves and production data are available for a number of years. In addition soils will be characterized physically and morphologically. Data on management and years of production are collected to estimate their effect on production.
The data are used in a simulation model to test the effect of the mentioned variables on production levels and to come to a quantifiable estimate of soil suitability for banana. Work starts in July, in cooperation with ASBANA. Student: Sytze de Bruin.
In the previous workplan this study was listed as "Suitability of soils for banana".

2B7 Organic matter content of soils
What happens to the soil organic matter content after deforestation? What is the influence of crop type, time of cultivation and soil type on levels of organic matter? To answer these questions time sequences on three soil types and for four different land use types will be selected. Sampling of those sequences and analytical work will be done in the period September - December followed by statistical analysis of data and reporting. Student: Sandra de Wolff.

2.4 Verification and complementation

The results of soil mapping and land suitability appraisals will be tested with the experience of farmers and other agricultural workers. Are the soil data and the suitability appraisals relevant from their point of view and what can we learn from their experience? Student: Sytze de Bruin. Co-supervisors: Fred van Sluys and Henk Waaijberg.

2C1 Field excursions

After completion of soil surveys and suitability appraisals field excursions will be organized to discuss the results with extension workers, researchers and farmers.

2C2 Interviews with farmers

Results of surveys, suitability appraisals and specific studies will be discussed with farmers. See also paragraphs 3.4 and 4.4.

3 LAND USE AND FARMING

3.1 Introduction

The baseline study focuses on patterns of agricultural transformations in Huetar Atlantica. One of the directions to view these processes is from within the farm: farming systems approach.

The farming systems studies described in this workplan analyse the transformations from the farm(er)'s point of view. They focus on the way the farmer views his changing ecological environment and socio-economic and institutional context, on the way he responds to the conditions and changes, and on changes he initiates himself: transformations in the farm structure.

As part of the baseline study three types of farming systems studies are done. First a broad farm survey among 50 randomly selected farms in each of the subareas, thereafter specific studies on smaller subsamples of farms about selected themes, followed by a third phase in which the obtained results and views are tested and complemented by confronting them with farmers' views. All steps involve literature study, talks with key informants in institutions and on-farm field work consisting of structured and open interviews and qualitative and quantitative field observations.

The main supervisor for the land use and farming studies is Henk Waaijenberg.

3.2 Broad farm survey

3A1 Field work

In each subarea 50 randomly chosen farmers were interviewed about the following aspects of farm and household: history and background, household composition, resources, activities, relations and problems. The interview of in total 150 farmers served to:

- introduce the CATIE/MAG/AUW programme to farmers and ask for their cooperation;
- provide a general picture of the agriculture in Huetar Atlantica;
- enable comparison between subareas and validation of the assumed differences between them;
- help to classify farming systems;
- identify the main problems experienced by farmers;
- place specific studies of smaller samples in a wider framework.

The field work was completed in January and February. The analysis continues during the second half of 1987.

3A2 Literature review and discussion with informants

Literature study and discussions with key informants of institutions to collect and review already existing knowledge of farming systems and their subsystems in Huetar Atlantica, published and not published. This work was started during the first half of 1987. It is continued during the second half.

3.3 Specific studies

Specific studies are intended to study agricultural activities, problems and possibilities in more detail. Those on land use and farming fall into 4 main categories:

- (1) Farm case studies: detailed analysis of the overall management of a few selected farms in order to understand how farms function.
- (2) Household: decision making, labour and consumption. Social organization and dynamics within the farm household: perceptions and goals of different members and how they try to attain them, who takes which decisions, how is labour divided, rights with regard to use of farm products.
- (3) Farm subsystems: off-farm work, cropping, livestock and agro-forestry systems.
- (4) Weather, production and workability. The influence of the weather (notably rainfall) in connexion with soil properties on crop yields and on the planning and execution of farm activities.

The emphasis of the specific studies is on the study of production subsystems as material reflections of past transformations, of the farmer's background, resources, possibilities and environment, and of the way he judges these. Moreover the present (sub)systems are the starting point for future transformations. The following aspects of each major production subsystem are studied (with variations): history, occurrence, the farm system of which it forms part, scale, importance, aims and decision making, inputs (land, labour, capital), management and technology, weeds, pests and diseases, outputs, ecological stability, technical efficiency, economical performance, social attractiveness, future developments and alternatives. Relations with other farm subsystems and with input supply, marketing, research, extension, credit will be taken into account. Emphasis is on changes, reasons for changes and practices, problems and possibilities.

The specific studies consist of analysis of broad farm survey information, literature review, visits to relevant institutions and field work (interviews, qualitative and quantitative observations) xcarried out in subsamples of the farms visited for the broad farm survey; the number of subareas included and the sample sizes depend on the subject. As the emphasis is on the deepening of insight and less on the collection of statistical data, for most specific studies about 10 farms are selected. Some subjects may have to be studied outside the subareas. For other subjects not individual farms but e.g. farmers' organizations may be the object of study. The studies are formulated in such a way that one or a few students can adequately cover them under supervision of one staff member.

3B1 Farm case studies 1

A few farms are visited frequently in order to get detailed insight in the farm management, the way people think about objectives, land resources, institutional environment, risk management, alternatives, future, etc. Carried out in all subareas by Henk Waaijbergen in order to keep in direct touch with the farm reality. Started in La Lucha in the first half of 1987 and to be extended to other subareas in the second half of 1987.

3B2 Farm case studies 2

Each of the students is requested to describe and analyse one farm involved in his/her specific study in detail. This deepens understanding of how farms work and provide examples for education and the illustration of publications.

3B3 Household: decision making, labour and consumption
Field work completed during first half of 1987.

3B4 Cropping systems: banana
Field work completed during first half of 1987.

3B5 Cropping systems: cocoa
Field work completed during first half of 1987.

3B6 Cropping systems: maize
Field work completed during first half of 1987.

3B7 Cropping systems: root and tuber crops
Field work completed during first half of 1987.

3B8 Cropping systems: fruits
Field work completed during first half of 1987.

3B9 Cropping systems: comparative study of economics
Field work completed during first half of 1987.

3B10 Intensive livestock systems: dairy
Field work completed during first half of 1987.

3B11 Extensive livestock systems: beef
Field work completed during first half of 1987.

3B12 Dual purpose livestock systems
Field work completed during first half of 1987.

3B13 Livestock systems: comparative study of economics
Field work completed during first half of 1987.

3B14 Agro-forestry systems
Field work completed during first half of 1987.

3B15 Weather, production and workability
The influence of the weather, notably rainfall, in connexion with soil properties on maize and cassava yields and on the planning and execution of farm activities. This study is related with 3B6 and 3B7. Subareas: Rio Jimenez and Neguev (La Lucha). Student: Olaf Erenstein (tropical crops). Field work was completed in June. From May to September a detail study is made of labour division, timing of activities and problems experienced in carrying out farm activities. Subarea: Neguev (La Lucha). Student: Jan Halbe Lunshof (agricultural engineering).

3B16 Cropping systems: agronomy of alternative crops for smallholders
With subsidies likely to decrease and farm gate prices to drop many

small and medium scale farmers are looking for and in cases already experimenting with alternatives for maize. Such alternatives include macadamia, pebibaye, peppers and ornamentals. This study concentrates on agronomic aspects of such crops. For economic aspects see 4B7. Student: Hans de Haan. Co-supervisor: Fred van Sluys.

3B17 Grassland productivity

Most of the farm land in the Atlantic Zone consists of pasture, with a large variation in ecological conditions, botanical composition, management and productivity. This study - partly a follow up of 2B4 - aims at a characterization of grasslands in the subareas, with emphasis on productivity. Student: Mariet Hermsen.

3.4 Verification and complementation

Knowledge of farming systems only gradually takes shape. During the first steps of the baseline study farmers and researchers have to get used to each other, important aspects may have been overlooked, or due to lack of insight it may not yet have been possible to translate them into appropriate methods/questions. Moreover the integration of the several disciplines involved in the studies also needs time. The verification has two objectives:

- to collect additional, more complex or sensitive information;
- to check the obtained views against farmers' knowledge and opinions.

For the on-farm component the verification takes place by interviewing. Part of the interviews will be structured, to enable quantification, a large part will be informal and open, a discussion with the farmer and his household.

3C1 Interviews of subsamples of farmers involved in previous studies.

3C2 Interviews of key informants, mainly farmers, inside and outside the subareas.

4 SOCIO-ECONOMIC AND INSTITUTIONAL CONTEXT

4.1 Introduction

Socio-economic and institutional factors have had and still are having a marked influence on the evolution of land use and farming in Huetar Atlantica. Most important within this context is the interaction between state policy, population aspects and farmers' strategies, and private enterprises - especially the banana plantations - linked to (inter)national capital.

The studies planned for the second half of 1987 will be complementary to the work of the first half of the year and will focus on access to and control over land, marketing, livestock development, regional planning, households and farmers' organizations. The studies will be general, i.e., at the regional level, and specific or at local or

subarea level: the different issues are studied from the point of view of farmers' strategies and initiatives as well as from the institutional point of view.

The different studies will entail:

- (1) Literature reviews, interviews with informants, institutions and organizations.
- (2) Specific studies.
- (3) Verification and complementation.

The results of the studies are to provide a better insight into the interaction between state-sponsored institutions and small farmers, thus explaining largely the social and institutional context. By studying this interaction, the limitations and perspectives for rural and agricultural development, as far as this context is concerned, will be identified for the three subareas and their smallholder farmers. Most field work will be carried out in the period September-November. The main supervisor for the socio-economic and institutional context studies is Fred van Sluys.

4.2 Regional studies

The studies at the regional level are to contribute to an understanding of the macro context and of the major conditioning factors for the processes affecting the transformation of land use and farming in the three subareas. This way the results of the specific studies can be placed in the wider, historical perspective of the region's agricultural development and in the general context of state policy, demographic and social aspects.

The studies at this level are generally descriptive and will be based on available information and on work being carried out by others. The specific studies at the local or subarea level are to contribute to the regional analysis of the themes listed below.

4A1 Role of the state and its policy

An analysis of state participation and the way the state promotes and responds to changes and consolidation of land use and farming through its projects and institutions, especially during the last 20-25 years. Emphasis will be on regional and sector policy (plans and projects), institutional and physical infrastructure in relation to access to and control over land, development and transfer of technology, price and credit policy, social or reproductive policy towards the popular sector (health, education, community development). The available literature will be reviewed, with reference to similar cases in Latin America (see 4B10).

In the second half of 1987 special attention will be paid to regional and sector planning. The work will be carried out in coordination with MIDEPLAN (Limon) and SEPSA (Zonification Programme), thus contributing to an actualized regional analysis and a basis for planning activities. Student: Gideon Kruzeman (agricultural economics and regional planning)

4A2 Demographic, socio-cultural and political aspects

A general analysis of the socio-cultural groups in the region and their mutual relations, as far as they play a role in the organization of agricultural production. Emphasis will be on demographic and migrational movements, social movements as affected by the state or by other dominant sectors both within and outside the region. Support will come from the studies 4A1, 4B2, 4B6, 4B9 and 4B10.

4A3 Agricultural history

An overview of the history of agricultural development in Huetar Atlantica from pre-Colombian times up to the present. Based on archives and literature. Emphasis will be on changes in land use, land tenure, rural and urban groups, national and international interest groups, distribution of agricultural production, relation with international factors. This study will continue on a general level.

The above-mentioned issues are studied in order to support a more general regional analysis and form part of the studies 4B2 and 4B10.

4.3 Specific studies: local level

The objective of the specific studies is to obtain a better insight into the general processes investigated. Apart from the history of settlement in the three subareas, the access to and control over land, and the development, communication and transfer of technology are studied from two points of view.

- (1) The farmers' strategy or view. Farmers develop their own strategies, with or without institutional support, to organize productive activities. They organize themselves to get access to and control over land, and other resources and services. They apply, develop and communicate own knowledge about farming and land use based on experiences and insight. They organize households and decision making. In other words, the farmers take initiative or respond to felt needs and state intervention, combining their own and external resources in order to get certain control and management capacity over the most important conditioning factors for agricultural production. The studies 4B2, 4B8, 4B9 and 4B10 focus on these aspects.
- (2) The institutional policy or development view. The state responds to observed needs and to needs felt and expressed by producers or social groups and to problems generated in this process, thus affecting changes and transformations in land use and farming. The organization and functioning of the official institutions as the expression of state policy will be analysed in the three subareas. Emphasis will be on institutions related to productive activities, for the time being especially land and technology, though social services like health care and education will not be completely excluded. Private initiatives and institutions involved in marketing, credit, technology and extension will also receive attention. The studies 4A1 and 4B7 focus on this approach.

4B1 Historical overview of the settlement process in the subareas
Each of the specific studies is placed in a historical perspective using material available and information supplied by informants. Combined it will provide material for a general overview. This study will continue with emphasis on Cocori and Rio Jimenez. See also 4B2, 4B6, 4B8 and 4B9.

4B2 Social organization and farmers' movement
An inventory and study of the different social groups and organizations as well as their alliances, and the way they influence access to and control over land, technology, markets, finance, roads, and basic social services. Emphasis will be on land and technology, on the way farmers' organizations influence farm activities and the conditioning factors beyond the local level, and on the role (ex)plantation labourers play in the development of peasant organizations in the area. This study will be continued. See also 4A1, 4A2 and 4C1. Student: Rolando Rivera.

4B3 Farmers' technology and knowledge development, communication and transfer; a farmer's case
This study was completed during the first half of 1987.

4B4 Technology and extension: IDA in the Neguev, an interface study
This study was completed during the first half of 1987.

4B5 Technology and extension: national banana producers
This study was completed during the first half of 1987.

4B6 Land: access, control and tenure in the subareas
Many changes in land use and farming in the Atlantic Zone are the result of insecurity of land tenure in combination with problems of technology and finance to make farming profitable. In this study emphasis will be on mechanisms for acquiring land (sale and purchase, squatting, speculation) and on the policy and experiences of IDA in interaction with users' strategies. This work will be continued with special attention to the Cocori subarea. Student: Charlotte Kamman (agrarian law). See also 4B9.

4B7 Economics of alternative crops for smallholders
With subsidies likely to decrease and farm gate prices to drop many small and medium scale farmers are looking for and in cases already experiment with alternatives for maize. Such alternatives include macadamia, pejobaye, peppers and ornamentals. The present study concentrates on economic aspects of these crops, notably on marketing, which is of vital importance for their success. See also 3B16 and 4A1. Student: Henk Pascha (agricultural economics). Co-supervisor: Henk Waaijenberg.

4B8 Household strategies
The individual farmer usually forms part of a household with several interdependent members, objectives and activities. Agricultural production is only one of these activities and thus explains only part of the farmers' strategy. A description and analysis of different household strategies in the subareas will be made with special

reference to food and income insurance. See also 4B9 and 4B10.
Student: Charlotte Kamman (agricultural economics).

4B9 Sociological aspects of livestock development

It is very much doubted whether livestock development, except for farms with substantial numbers of heads of cattle, is economically feasible. Also its technical and ecological feasibility are questioned. Nevertheless about 60 percent of the agricultural land in the Atlantic Zone is under pastures. Other reasons than cattle farming are expected to explain for this land use type. The present study concentrates on the sociological aspects of livestock development, with special emphasis on the rationale of this ever expanding type of land use. The study will be at regional level with special attention for the subareas. Student: Willemien Brooymans. See also 4B6. Co-supervisors: Henk Waaijenberg and Wim Wielemaker.

4B10 Interface between peasants and implementors

When implementing planned activities problems may arise at implementor/extensionist as well as at peasant/client level. Such problems may be the result of lack of suitability to local conditions of the measures proposed or the inability of extensionists and other low-level functionaries to reach the target population. On the other hand, certain characteristics of peasant groups may further or check institution led actions. The proposed study includes an institutional analysis of the land reform and colonization agency IDA, and a detailed study of the interaction between peasants and implementors in a few settlement areas. The study forms the subject of a Ph.D. thesis, and is carried out by Pieter A. de Vries.

4.4 Verification and complementation

The preliminary results and conclusions from the global analysis and the specific studies are presented to and discussed with farmers, farmers' organizations, officials and government institutions. Their participation is an essential part of the research methodology of the baseline study, and is an instrument for local and regional diagnostic and for planning of both institutional as well as farmers' strategies.

Study and verification meetings and seminars are organized to initiate a process of communication, back feeding and verification, discussing and deepening views on different issues with officials, government institutions and farmers' groups and organizations. Methods and techniques will be adapted to the group dynamics and organizational level within the farmers' sector and institutions in the subareas. The approach is integrated, interdisciplinary and participatory (see 2.4 and 3.4).

4C1 Study and verification seminars with farmers' groups

In each of the subareas a series of seminars with farmers' groups will be organized together with local officials and technicians. These seminars are an instrument for further deepening and verification of the analysis, and an instrument and methodology for farmer training. The activities are coordinated with IDA, MAG (PIPA) and farmers' groups or organizations in the subareas. Student: Alberto Rojas.

4C2 Study and verification seminars at institutional level
In this semester a start will be made with seminars together with different development and research institutions in the region in order (1) to deepen and verify the multidisciplinary analysis of the major transformations in the region, and (2) to discuss and plan future institutional activities for development and research.

5 TALAMANCA BASELINE STUDY

The baseline study, which so far has been confined to the northern part of the Atlantic Zone, will be extended to the lower Talamanca Region, i.e., to the districts Cahuita and Sixaola of the canton Talamanca

For methodological reasons only the major stages of the study are being indicated. Each stage has its specific objectives and is to provide results and an orientation for the following stage. These stages are:

- (1) A regional survey.
- (2) Specific studies.
- (3) Verification and complementation.

5.1 Regional survey

A field team comprising the disciplines soil science (Annemarie Bok and Ed Veldkamp), agronomy (Elle Roseboom) and socio-economics (Leandro Guadamuz Guadamuz), starts an integrated survey with emphasis on the different plans and projects in the region and on existing information. The survey is to provide a first characterization of the most important phenomena and changes occurring in the region. It comprises:

- (1) An identification and description of the geographical differentiation in terms of natural resources (a reconnaissance survey indicating land capability), land use systems, and socio-economic and institutional structuring.
- (2) An identification and description of significant problems and items for further studies to be carried out in one or more sub-areas selected for this purpose.
- (3) A proposal of themes and methods for specific studies.

Throughout the survey the field team will cooperate closely with regional institutions and programmes like MIDEPLAN, MAG, ANAI, UNA, COOPETALAMANCA and CATIE/GTZ.

5.2 Specific studies

The problems and items selected as a result of the regional survey will be studied in detail. Depending on their nature one or more disciplines will be involved. Specific studies can be case studies or are of a more general nature.

5.3 Verification and complementation

An integrated analysis of the specific studies completes the survey. This first approach provides a basis for the preparation of a monograph and the identification of necessary additional studies. The research methodology includes a permanent confrontation and farmers' participation, though a more systematic and integrated confrontation will be programmed for the first half of 1988.

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ANNEX 1. DELINEATION OF SUBAREAS

1 Cocori

The subarea is situated in Colorado district of Pococi canton. The western and eastern boundaries are formed by the coordinates 5.62 E and 5.72 E respectively, the southern and northern boundaries by the coordinates 2.78 N and 2.90 N respectively of the Lambert projection of northern Costa Rica. The subarea measures 120 km² and is covered by the mapsheets Tortuguero (3447 I) and Chirripo Atlantico (3447 IV).

2 Rio Jimenez

The subarea consists of the western half of Rio Jimenez district of Guacimo canton. It covers the segments 1, 2 and 7 - 16 of the 1984 agricultural census. The subarea is about 55 km² and falls within mapsheet Guacimo (3446 I).

3 Neguev

The subarea is the Neguev settlement scheme and lies within the districts Rio Jimenez and Pocora of Guacimo canton and Germania and Cairo of Siquirres canton. The subarea is about 55 km² and is covered by the mapsheets Guacimo (3446 I) and Bonilla (3446 II). About one fifth of the settlement scheme overlaps with the Rio Jimenez subarea.

4 Cahuita

The subarea is the district Cahuita in Talamanca canton. It is about 173 km² and is covered by the mapsheets Amubri (3644 IV) and Cahuita (3645 III).

5 Sixaola

The subarea is the district Sixaola in Talamanca canton. It is about 237 km² and is covered by the mapsheets Sixaola (3644 I) and Amubri (3644 IV).